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# FUTURE LIFE

#26 May 1981

## FEATURES

- 14 TOMORROW'S HOUSES**/Bob Woods. Eight visionary designs from a group of renowned architects offer alternatives in living space.
- 22 THE DIRECTOR WHO ATE HOLLYWOOD**/Ed Naha. An interview with Roger Corman, the king of low-budget science fiction filmdom.
- 26 INTERVIEW: POUL ANDERSON**/Malcolm Brenner. The world-famous author discusses his approach to art and science.
- 29 TO THE STARS ON QUICKSILVER**/David L. Nicol. How ion propulsion may one day help us explore our universe.
- 44 OUTLAND**/Ed Naha. Director Peter Hyams explains how his new science fiction film is also the grittiest.
- 52 FROM HOUSEWIFE TO HEROINE**/Barbara Krasnoff. Women in SF films have always drawn a raw deal—but has it gotten any better?
- 64 ROBOTS INVADE PITTSBURGH**/Abby Gelles. A new Robotics Institute forecasts a new age in the industrialization of robotics.



58

## DEPARTMENTS

- 4 OUTPUT**/Kerry O'Quinn. A message from the Publisher.
- 6 INPUT**/Space politics, Soviet tricks. Letters from our readers.
- 9 DATABANK**/Rodent clones, computerized loans.
- 21 ALTERNATE SPACE**/Carolyn Henson. Lase the nukes.
- 32 AN EDGE IN MY VOICE**/Harlan Ellison. Answering the mail.
- 37 GALLERY**/Thomas Boud's hidden universes.
- 41 IN PRINT**/Bob McCoy and Robert Anton Wilson. Book reviews.
- 56 SOUNDSCAPES**/Lou Stathis. Introducing the column.
- 58 PORTFOLIO**/Barbara Krasnoff. The art of Dale M. Figley.
- 68 EARTH CONTROL**/Bob Woods. The politics of ecology.
- 70 TOMORROW**/G. Harry Stine. Scientists vs. engineers.



52



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**ON THE COVER:** Despite its appearance, this is not a house of tomorrow. Rather, it's a home that could be built today. For more information on this and other alternate architecture, see page 14.

# output

## The FUTURE LIFE Philosophy Part I "The Overall Theme"

Everyone on Earth has a philosophy of life. We really have no option; it's an accessory of being human.

Most people's philosophical ideas are a random, inconsistent collection of values and emotional reactions gathered over the years and stored away in their subconscious—yet directing their every move. Most magazines are similarly constituted, but I want readers of FUTURE LIFE to have a clear, black-and-white statement of the fundamental principles for which we stand.

The first question one might ask is, "Why does a magazine *need* a philosophy?" In simple terms, we need a philosophy for the same reason a person needs one—to direct our every move—to guide us in our choices and actions.

We need standards by which to select our article subjects and the writers who will bring them to life. We need principles to help us decide what to include and what to reject—principles that give the magazine a consistent perspective in spite of the fact that FUTURE LIFE is created by numerous persons, each with a different *personal* philosophy. Our magazine philosophy unites us (in print) and aims us, not at everyone alive, but at a particular segment of the population.

After all, we aren't *The New York Times*, and we do not try to cover that *broad* a spectrum of topics. We aren't the *National Enquirer*, and we do not aim at *their* readership. So—who are we, and who do we aim at?

That is what the FUTURE LIFE philosophy will tell you.

The philosophy of a magazine differs in several important ways from the philosophy of a person—mainly, a magazine does not need to define its position on multitudes of individual topics. For instance, the FUTURE LIFE philosophy boils down to only *three* fundamental principles, each of which I will discuss during the next few issues.

But to begin with there is an overall premise which is our philosophical theme: *the conditions for human life can be improved.*

Now, that may seem like an idea that more or less goes without saying—an idea that everyone believes. Unfortunately, it is *not* a universally held idea, and it does need to be put in print right here at the start.

For instance, there are many religious philosophies that believe life is a "veil of tears"—by its very nature, an ordeal we must endure in order to receive, eventually, our reward in heaven. This is *not* an archaic notion; it is one of the tenets of many prospering, big-time, present-day religions.

If we did *not* believe otherwise, it would be absurd to publish a magazine whose main thrust is exploring the routes to a better future. Because "better future" can only mean a future in which *the conditions appropriate for the achievement of individual happiness are maximized.*

There is not a pre-formed answer to this problem; there is no guru sequestered high in the Himalaya Mountains who, when found, will hand us "the secret of life." That is why, within our pages, we provide for many divergent ideas and proposals—an excellent example of which is the variety of articles we have presented on alternate energy sources for the future.

But, as I have said before, there are certain fundamental ideas which we consider to be *above question*—which are *essential* for human happiness and, therefore, which you will *not* see debated in this magazine.

Those ideas we accept as our foundation, and on them we hope to build an improved future. Those ideas are the FUTURE LIFE philosophy.

Kerry O'Quinn/Publisher

Next issue: "Free Enterprise"

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## ON THE STRAIGHT BUT NARROW

... "Republicans," reads the Republican Party Platform 1980, "pledge to support a vigorous space research program." And now these Republicans control the White House and the Senate, and have made significant gains in the House. As space activists, we should be overjoyed.

Or should we be? I keep remembering that Spiro Agnew supported enthusiastically an effort to put humanity on Mars in the 1990s—but I wouldn't buy a used spacecraft from that man if our sun went supernova. So, we are left with a very important question: Should we support a candidate just because he or she supports an active space program? Or, to put it another way, shall the space activism movement join the ranks of the anti-gun-control lobby, the anti-abortion forces, the Moral Majority and every other single-issue group that judges candidates along very narrow lines?

The grassroots political movement in support of expanded space exploration efforts is new and diverse, but it is not too soon to begin asking this question. To boost the space effort, we have to have political clout. Do we have to be a one-issue movement to have that clout? I first asked this question when I received my October 15, 1980 newsletter from the National Action Committee for Space. Now, I fully support the efforts of a group like this which records and distributes the voting records of U.S. Senators and Representatives, and works as a lobbying force on Capitol Hill. That is the American political way.

That newsletter, however, contained a letter of support for Senator Mathias of Maryland, urging all space activists to support his campaign with money, and, for those who live in Maryland, with volunteer help. The letter seemed to take for granted that the senator's support for a strong space program was all we needed to know about him. But wait a minute... what is his stand on the ERA? on immigration? on abortion? on air-quality controls? on foreign policy? on the draft?

I am sure that the good people at NACS assumed that people would familiarize themselves with the overall record of the senator before writing out their checks. But in a world too full of information and too little equipped with time to seek all of it out, the potential for becoming a one-issue movement

is real. Along that path waits disaster.

For whatever reasons, Republican members of Congress tend to support space exploration more than do Democrats. This does not mean we should therefore work to vote all of those Democrats out of office. If the space movement aligns itself along heavily partisan lines, if we become too strongly allied with the conservative, business-oriented ideologists only, we will never win a broad base of support among the general population. We dare not kid ourselves that Reagan's victory means an overwhelming affirmation for a corporate-run America.

There is no doubt that the vast majority of Americans are tired of inflation, unemployment, decaying cities, violence and crime (which, by the way, were the forgotten issues of this last election) and the whole list of Earthly ills. Too many of them, in their heart of hearts, think that "we should spend the money here on Earth, instead of putting some clown on the Moon." It is these people, of all political beliefs, that we must convince. They, in turn, will create a political atmosphere in which members of Congress will eagerly support an active space program.

We must not help defeat good, competent politicians just because they are against the space program, especially if the alternatives are less qualified candidates. We are not powerful enough yet to have such an effect, nor have we yet allied ourselves with one group or another. Let us work to keep our influence a positive, non-partisan one, however powerful it may eventually become.

Kathryn M. Drennan  
San Diego, CA

## SPACE RACE REVISITED

... I would like to comment on the letter written by David Morris (FUTURE LIFE #24).

David, I respect your opinion and would like to see the day when all nations will combine their efforts toward the peaceful exploration and settlement of space.

However, you must realize some of the realities that presently hold us (the world) back. First, in order for the United States to invite other nations to join in efforts to realize the Final Frontier, the United States must put forth a total effort in regards to the exploration of space. While it is true that the U.S. led the way toward the opening of the Final Frontier, it is also true that the U.S. government has cut the budget for space exploration drastically. At the present moment, scientists are battling just to keep the space program alive (which many ignorant members of Congress do not want. Senator Proxmire is a classic example). Until the United States can bring about a Renaissance for the space program, the realization of our dream (yours and mine) is all but impossible.

Second, you suggested that we (the U.S.) should share our technology with the Soviet Union. I wouldn't mind this, but I do not

think it would be wise at this time. When you consider the Soviet's record (of world policy, etc.) you can see why the United States would hold back all of its technological secrets. If Afghanistan hasn't told you anything, I feel sorry for you. If the U.S.S.R. had a cleaner record, then the U.S. would have already shared a few secrets. The way it stands, the U.S. will not be telling the Soviets anything until they clean up their act.

Third, in respect to your comments about the UN, do you really believe that the Soviets will listen to the UN when their policy differs from that of the UN? And when the U.S.S.R. violates the UN laws concerning space, what is the UN going to do about it? Nothing. Of course, the UN can reprimand the U.S.S.R. for its actions. But that won't get the Soviets to stop.

I hate to say it, Dave, but Tim is right to a certain extent. The dream exists, but it might take a little time. One more thing before I forget: The United States is not totally isolated from the world in terms of space exploration. The U.S. has helped with the development of space exploration in other countries (mostly European). While it is true that the U.S. has been helping out with just satellites, I believe that these nations will be helped out in manned space flights as well if the U.S. government stops foolin' around and gives the space program what it needs in terms of money.

Chris Tate  
Evansville, IN

## IN THE KNOW



... When you publish articles and news items promoting the space program, I wish you would make a greater effort to get writers with enough technical expertise to know what they are talking about, rather than lay people whose enthusiasm leads them to blindly accept exaggerated or false claims about the Earthly benefits that have or will come from space technology.



Many products are claimed as spinoffs of space-age research simply because they were used at one time or another in a spacecraft. Perhaps the most notorious example is Teflon, which was actually invented back in 1938 and used for high-temperature electrical insulation.

What must take the prize, however, is your article "Space: Is It Worth It?" (FUTURE LIFE #23) which asserts that the space program is responsible for the invention of the integrated circuit. Why, thin-film integrated circuits were already several years old when NASA was created in 1958, and Jack Kilby of Texas Instruments had already fabricated the first integrated circuit formed entirely from a single piece of silicon. During the subsequent years of intensive development, direct expenditures by industry far exceeded government-sponsored work.

Another fact you neglect to mention is that most of the alleged "spinoffs" can be attributed to NASA's Earth-oriented projects (guided missile systems; communications and remote sensing satellites) rather than to its activities in actual space exploration and development. In the particular case of integrated circuits, government funding was devoted primarily to the improvement of electronic circuit *reliability* in order to reduce maintenance costs for guided missile systems. It was this emphasis on the advantages of the circuit's "integrity" that led to the acceptance of the name "integrated circuit" rather than the alternative "microcircuit." It is simply not true that integrated circuits were "specifically invented to pack as much electronic gear into as tiny a payload space as possible," as stated in your article. To quote James Bridges, who was in charge of government funding for electronics in the early '60s: "... if its inherent advantages of improved reliability and lower cost were absent, and only size and weight benefits were valid, the technology of integrated electronics would not be moving with the national impetus it now receives."

Some statements in your magazine are so ridiculous that one hardly needs any expert technical knowledge to spot them, such as Carolyn Henson's assertion that there would be hardly any stress on your joints if you went jogging on the Moon. ("A Runner's Heaven," FUTURE LIFE #23) Now surely, if you expect to get any useful benefit, physical or mental, from jogging on the Moon, you must expend approximately the same amount of energy as you would on the Earth. This means that your stride will be six times longer, and you will rise six times higher off the ground. So when your feet return to the surface they will have been accelerated for a six times greater period of time. You don't have to be an expert in the physics of locomotion to realize that this will subject your feet and legs to the same stresses they were subjected to on Earth! Sure, you can take short and shallow steps, but then you're not jogging any more,

you're just walking. And I notice Henson doesn't seem at all worried whether the Moon's gravity is sufficient to prevent the health problems like osteoporosis that are caused by prolonged weightlessness.

Henson then goes on to assert that you won't be able to roller skate any faster on the Moon, because friction won't be affected significantly by the change in gravity. May I suggest that she see how much force it takes to push an empty roller skate along the floor, and then see how much more force is required if somebody happens to be standing on the roller skate. Indeed, I would expect that rolling friction is so much lower on the Moon that someone in roller skates would have difficulty just keeping their footing.

If I can find this many erroneous assertions by space enthusiasts, just from my own store of knowledge, how can I believe what they say in other areas with which I'm less familiar? Are these the same sort of people who 50 years ago were saying that in 1980 we would have moving sidewalks and personal helicopters instead of cars? Or who 25 years ago said that we would be driving ground-effect vehicles, communicating by picturephone and wearing a new set of paper clothes every day? Or said that nuclear fission would usher in a new era of energy "too cheap to meter"?

George Fergus  
Corporate R & D Laboratories  
Motorola, Inc.  
Schaumburg, IL

### LEARY FAN

... Thank you for letting Dr. Timothy Leary write "Superstar Scientists" in the Tomorrow section (FUTURE LIFE #24). It's the best Tomorrow ever! I am a big fan of Dr. Leary, and love his writing. Also thank you for the "Cryonics Meltdown" article. FUTURE LIFE's the greatest!

Mark Roulston  
Middleburg, FL

### NUCLEAR NEWS

... With reference to Ed Naha's Databank article "World War III x 2," in FUTURE LIFE #23.

Nuclear weapons and nuclear war seem to be on everyone's mind at the moment. The coverage the various forms of media are giving to every nuclear-related occurrence is quite astounding.

The numbers of nuclear-related books and magazines that have appeared at our newsagents and bookshops within the past six months is quite staggering. Good examples are: *Protest and Survive*, and *The Nuclear Survival Handbook*. The British Government is presently in the process of coming to a decision as to whether a nuclear survival handbook, first drafted in the 1950s, should be made freely available to the general public



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(the feeling is that this may cause major concern in the population).

A storm has also blown up over the government's decision to allow the U.S. to base cruise missiles on the east coast of Britain. Interestingly enough, in a recent television broadcast an important military figure from the U.S. was quoted as saying that he would willingly sacrifice Britain to save the U.S. in case of nuclear attack. Understandably, this talk did not generate any amiable feelings!

The result of this rather loose talk and other such debates has caused the CND (Campaign for Nuclear Disarmament) to step up its campaign in the form of rallies, marches and mass protests, for the abolition of nuclear weapons. The CND has never seen such a huge growth in its membership.

More arguments continue as to where spent nuclear fuel is to be dumped. One choice area at the moment, is central Wales (the waste buried in granite and salt). But it is felt that this waste may eventually seep out of its underground tomb through the action of underground streams and other forms of weathering. Many thousands of acres could then be radioactively polluted with danger to humans and livestock.

All of these points round-down to one thing. People equate the word "nuclear" with nuclear bombs, with warfare, with death. To most people, "nuclear" conjures up images of mushroom-shaped clouds, burnt and peeling flesh, radiation and Hiroshima. It must always be remembered that the nuclear bomb is the destructive force. It is politics that "pulls the trigger."

I feel that most countries throughout the world are preoccupied over the possession and non-possession of the "nuclear deterrent." Agreement must be reached between the nuclear powers to limit the manufacture and, more importantly, the spread of nuclear weapons.

Aldo G. Rabaiotti  
West Glamorgan, South Wales

## ALTERNATE OPINIONS

... To Carolyn Henson: I consider the cause of space to be truly blessed with someone as intelligent and determined as yourself. However, I did not like your column in FUTURE LIFE #24 at all.

What you said about Mr. Bossong was unfair, unjust and against all that I hoped you believed in.

You didn't defend your statements well, and that is what gets me upset. The facts are that SPS is expensive, you never disproved that. It is expensive. Estimates from the National Space Institute range to \$500 billion. Plus research, etc. Expensive. Bossong is right, but he is wrong. I believe that SPS may still be worth the cost.

Your mistake is that, like Mr. Bossong, you have a closed mind. Yes, you do. And you are on the opposite sides of the fence. Beware, this is dangerous. There is an excellent

chance that SPS is unfeasable—do not despair, we shall get into space, where I shall meet you. I want out, and into space. Have patience. Bossong is not the villain, poor excuses to get us out into space are. He has legitimate complaints, refute them, if you can. Space is expensive, but worth it. There are better reasons for space habitats, explore those.

If you want to write nasty columns, go after the Moon Treaty in the UN. Your last column on that was excellent. Keep up the good work.

Kevin Mooney  
Housatonic, MA

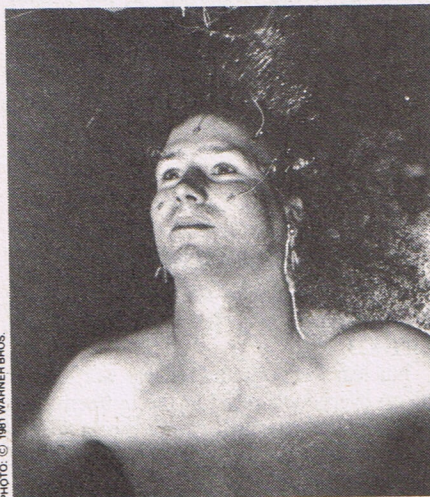
## ABSURDITIES

... This is a despicable letter. Sorry.

Whoever believes in the absurd notion of evolution has no room to belittle religion. Once more Timmy Leary proves himself the anal sphincter of a north-going mule by compiling a hodge-podge of the very homilies of which FUTURE LIFE is so fond (FUTURE LIFE #24). Ah, the poor, victimized Scientists! You must admit that their gropings in the muck have produced some prize clinkers. And gullible FUTURE LIFE fell for the line like a ton of barnyard fertilizer. And you are the Smart Ones? Fortunately, the Luddites and others of their ilk, however misguided, have served as a moderating influence. Otherwise, the Smart Ones would have us in real trouble by now. The unforeseen is always such a nasty surprise.

G. Davis  
Portland, OR

## ALTERED REALITIES



... I would first like to say that I have seen *Altered States* and have read it in script form. The film is astounding both visually and intellectually, a combination that is extremely rare these days, and one which had a rather strange, profound physical effect on me. The night I came home from the screening I was shaking somewhat but was so tired I immediately dozed off. No dreams. I jumped up out

of bed suddenly at about five o'clock that morning, startled by something I had no recollection about. It was then I noticed my pillow was nowhere in sight. Had I eaten it? Upon further investigation beneath and around my bed, I looked up and caught sight of it on the other side of the room, approximately three meters from my bed! To this day I have no idea as to what caused me to attack my pillow and throw it like that, knowing that at the time I was under no artificial stimulation whatsoever, and rarely am at all.

Thus it is in a sober respect that I say *Altered States* may have one hell of an effect on entire masses once it is released generally, and will definitely be a landmark film of the '80s.

Mike Lyddon  
Santa Ana, CA

## FORWARD INTO THE PAST

... I recently bought a copy of issue #24 of your fine magazine dated Feb. 1980. Despite the goof, FUTURE LIFE remains one of my favorite magazines. Keep up the good work. Hopefully, you'll be around for a long, long time.

Robert Deal Peterson  
Council Bluffs, IA

*It just goes to show that occasionally we take a look into the past as well as the future. ...*

## CORRECTION

... I would like to make a correction concerning the "Rock 'n' Roll Laser Art" of *True Colours* (FUTURE LIFE #23). The performers, whom you describe as being an Australian rock and roll group, are in fact New Zealanders. As an avid fan of this great group, Split Enz, it irritates me somewhat to see their name put under another nation's.

Apart from this I found your magazine very enjoyable and shall continue to buy it and benefit from its interesting articles.

Robin Sutcliffe  
Auckland, New Zealand



ART. © 1981 DON DOUGHERTY



# atabank

## CLONING AROUND

### SEE HOW THEY RUN

A standard plot for science fiction films concerns the creation of armies of cloned, identical humans bent on taking over the world. While this doomsday scenario may be somewhat unrealistic in its view of the results of genetic engineering, the actual concept of cloning is not. In January, 1981, scientists at the University of Geneva announced that they had successfully developed the first mammalian clones. By transplanting the nuclei from undeveloped mouse embryos into previously fertilized eggs, Drs. Karl Illmensee and Peter Hoppe were able to produce three living mice with the same genetic makeups of the original fetuses.

The process went something like this: Using a micropipette, an extremely thin glass tube, a nucleus was extracted from the cell of an embryonic mouse (from a gray mother). The nucleus was then placed in a fertilized egg which had been removed from a black mouse, and the nuclei already present in the egg were removed.

Once it was determined that the egg was developing normally, it was placed in the womb of a white mouse, and carried to term. (The use of differently colored mice made it easier to distinguish the genetic background of the newborn.) In this way, out of 16 successfully implanted embryos,



PHOTO: COURTESY CELL MAGAZINE

Three cloned mice: From the pages of science fiction comes a real-life experiment in cell reproduction.

three cloned mice were produced, each with the same genetic heritage as its original embryonic donor.

While one of the three subsequently died young, the other two lived to adulthood. Both eventually reproduced, and their progeny exhibited the type of hereditary traits expected from the transplanted nuclei.

Actually, this was not the first time that animals have been successfully cloned. As far back as 1952, transplants of cell nuclei to

produce cloned offspring were done using frogs and other amphibians. However, this is the first time that such a procedure has been successful using mammals.

However, don't start looking for those battalions of invading clones just yet. There is some disagreement among experts as to whether the mice are actually clones: first, because only one was produced from each set of genes; and second, because the original fetus was destroyed when

the nucleus was removed from its cell, thus making the newborn mouse the only one with that particular genetic makeup. And remember that the nuclei used in the Geneva experiments were taken from blastocysts, very early embryos whose cells were still in a relatively simple stage. Scientists have not yet determined how to produce a clone from the highly specialized cell of a fully developed animal.

But they're trying.

—Barbara Krasnoff



## SOUNDS

### BASTARD MUSIC

"I like to think of my music as 'bastard music,'" says composer/synthesist Francois Bréant, without the slightest hint of self-deprecation coloring his voice. The young Frenchman, whose second solo album, *Voyeur Extra-Lucide*, was recently released in this country on the Egg/Visa label (loosely translated the title means "clairvoyant voyeur"), is searching for an adequate way to describe the eclectic blend of influences that make up his music. Bréant's unique synthesis of styles, instruments and sonic ideas shimmer with the vitality of what biologists would call "hybrid vigor," and reflects what the musician perceives to be the current state of global culture.

"The modern world is bastard—especially this city," he states, pointing out the window of his New York hotel room. "All these influences, details and everything else fit together to

make something peculiar, personal and distinctive. I think my music is a little bit like this city, in that I mix elements which are basically not supposed to fit. I hope it's personal and distinctive, and that it sounds like Bréant and no one else." He pauses, and then chooses some examples to illustrate. "Frank Zappa and the Beatles both are examples of superior bastard music. Everything goes through their heads, but it comes out distinctly Zappa and Beatles. The ways these people treat their influences are more important than the influences themselves."

Like many other French thinkers and musicians, Bréant is strongly influenced by black American culture. In fact, he's quite convinced that the contributions made by black musicians in the United States will soon be recognized as the most important of this century. "Blues, jazz, rock'n'roll—all the dominant musics of today were first played by black Americans," he says.



PHOTO: EGG-VISA RECORDS

Bréant: French synthesizer of eclectic music.

Bréant shyly confesses to an intense fascination for Yankee jazz while a young boy in Rouen, France, and later, while a teenager, to an equally strong affection for rhythm & blues and soul music. "I like things that are passionate," he offers, "that communicate something about feelings—like a scream. It has to be more than just well done."

After playing piano with various jazz and R&B groups in France during the '60s, François found himself part of the burgeoning progressive rock scene of the early '70s, contributing keyboard work to such seminal French bands as Cruciferius (progenitor to Magma, one of the strangest rock bands in history), and later Nemo. In 1977, he met and joined forces with Bernard Lavilliers, a radical singer/songwriter very popular in France. Their association still thrives, second in priority only to François' own solo career. The busy musician has also found the time to play a great many recording sessions, as well as compose and perform music for French television.

Bréant began his in-earnest composing career with the 1978 release of his *Sons Optiques* (available as an import only, on the French Egg label), which, as the title indicates ("Optical Sounds"), presents a strong sense of visual imagery to the listener. François describes the album as "soundtracks for imaginary films which are to be made up by the listener." On *Voyeur Extra-Lu-*

*cide* this idea was taken one step further. He explains, "I sent a rough mix of the album to a friend who is a music teacher. I asked him to play it for his students, and have them write down little stories that come to them out of the music. When I read what he sent to me, I discovered a great many common images. For instance, the song they all wrote that sounded like a hot summer night in an American jazz club, I called 'August 8th, A Quarter After Midnight, 125th Street.'" Each of the cuts on the album is named from the images suggested by the children's stories.

François sees the spreading of Western culture throughout the world, and the intermingling of it with various ethnic cultures, to be essential for artistic progress. "Western culture feeds on African and South American culture. It needs them to move itself forward." Unlike other cultural observers, Bréant doesn't believe that Western society overpowers and devours ethnic influences. "Neither is more powerful than the other—the exchange goes both ways." As to his own music, Bréant believes there's only one way it can go: "More bastardized, because that is the way of cities in the future. I digest various cultures and then give them back in different ways. I never really invent anything, actually, I just organize influences in a new way. That's what all art is, really." —Lou Stathis

## BUDGET BOOST

### VIKING FUND

In FUTURE LIFE #24 we ran a Databank item calling for support of the Viking Fund, a private group (operating under the auspices of the American Astronautical Society) advocating space activities. In particular, the group seeks funds to pay for the continued monitoring of the Viking lander which landed on Mars four years ago. Due to budget cutbacks, NASA has run out of money for study and analysis of Viking data. The Fund requested space enthusiasts to contribute one dollar to further the exploration of the red planet.

Well, the dollars came in, and at 9:00 a.m. on January 7, Viking Fund organizer Stan Kent presented NASA with a check for \$60,000. Dr. Robert A. Frosch, the NASA administrator who must decide what to do with the Viking robot, accepted the check during a ceremony held in front of the full-scale model of the Viking lander at the National Air and Space Museum in Washington. The gift, which will guarantee at least two more months of data analysis, was described by Noel Hinners, the museum director and a veteran of the space program, as a "true historic event."

Reagan will do in the way of further funding of the shuttle and other space exploration programs—a Halley's comet rendezvous, planetary probes, etc.—has not, as of this writing, been stated.

Meanwhile, across town at NASA headquarters, the space agency has officially approved the continuation of Voyager 2 on a trajectory which will take the satellite to Uranus in 1986 after its flyby of Saturn this August.

Bon voyage!

## NASA NEWS

### FOR YOUR INFORMATION

Though the details are unclear at this point, the Reagan Administration has decided to keep the space shuttle program intact. David Stockman, the new President's Office of Management and Budget director, revealed that the shuttle program is among those that will be exempt from any budgetary cuts. Exactly what



## TOURIST TRIP

### SPACE MUSEUM

What's egg-shaped, lives on a peninsula and has lots of stars inside it? If you said the Hong Kong Space Museum, you're right. Christened last October, the museum is part of a massive cultural complex situated in the heart of Tsum Sha Tsui, Hong Kong's center of tourist activities. With 9,000 square feet of exhibit space, the building houses a \$40-million, oval-

shaped museum, with a large planetarium in the center and exhibit halls ringing the perimeter.

The museum chronicles the history of the investigation of our universe, from pre-history to the present, through a series of 31 permanent and complete exhibits, including multi-media shows and historical artifacts. Lander Associates of San Francisco spent three years designing and supervising the project for the government of Hong Kong.

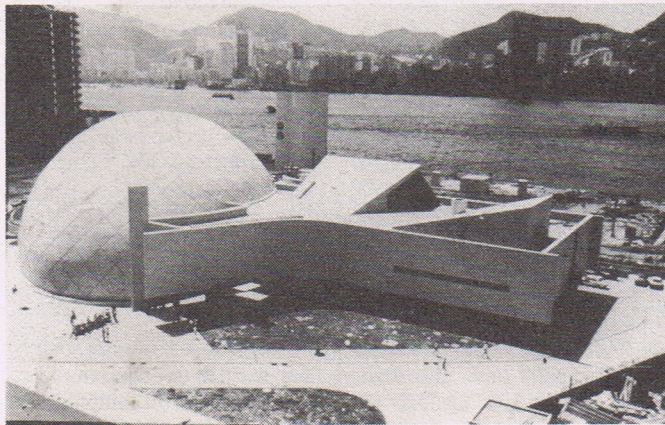
Of particular note is a minia-

ture planetarium that in two and a half minutes depicts a year's worth of night skies over Hong Kong. Other displays explain the solar system, showcase modern and ancient telescopes and offer artifacts from the Apollo and Skylab missions, as well as the Aurora 7 Mercury space capsule which orbited Earth in 1962. Eighty Landsat color-enhanced photos capture several areas of the world in a unique pose. Intriguing "histomaps" provide a historical perspective, relating ac-

complishments in astronomy and space to the political situation and scientific inventions of the time.

Adjacent to the Space Museum is the Hall of Solar Science, which is now under construction. This structure will be highlighted by a working solar observatory where the public can watch staff members study the sun and live images of such phenomena as sunspots, sun flares and the living surface of the sun itself.

—Bob Woods



9,000 square feet celebrating human endeavor.



Rocketry exhibit chronicles space exploration.

PHOTOS COURTESY LANDOR ASSOC.

## CHARGE!

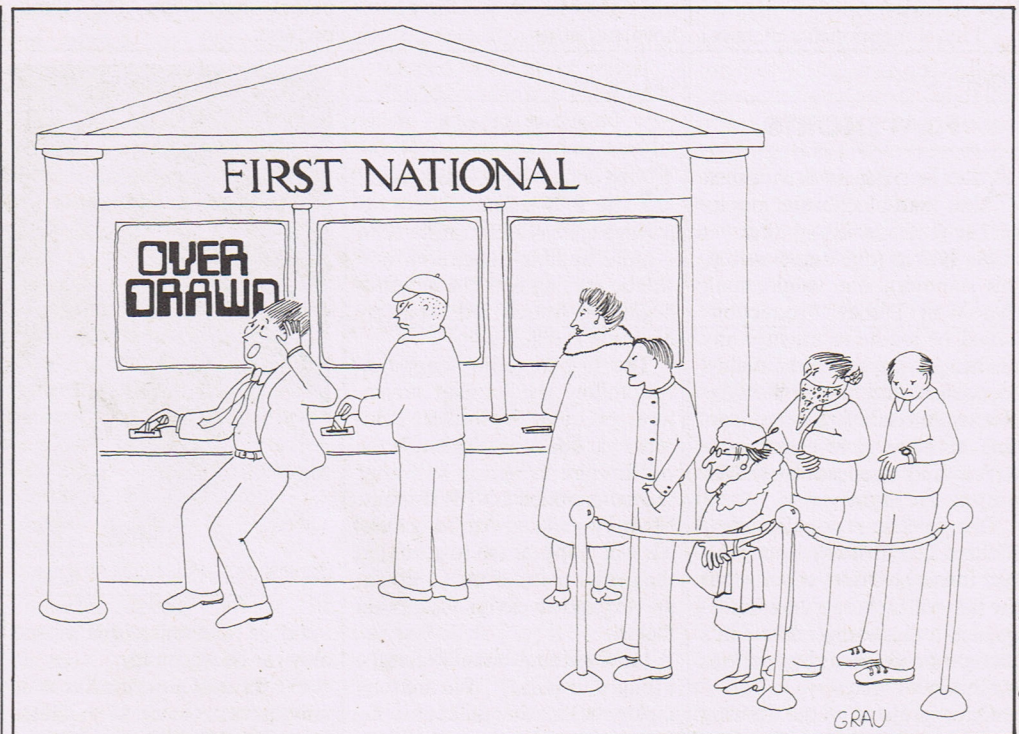
### COMPUTERIZED CREDIT CARDS

Those cards of plastic money are about to undergo a subtle change, thanks to the computer revolution. According to Richard Darwin of the Battelle Memorial Institute of Columbus, Ohio, bank credit cards will be distributed with microprocessing computers, complete with memory, printed into the plastic.

It's going to work like this: When you insert the card in a bank computer terminal and ask for your credit balance, you will not only get the information on a CRT, but the amount of the balance will be entered on the card.

The card holder will make his purchases at stores that have special reading devices. These devices will "read" the credit card, deduct the amount of the purchase, enter the new balance on the card, and at the same time prepare a debit notice on the transaction for the bank.

The "computer-in-a-credit-card" is slated to be introduced



ART © 1981 LEIGH GRAUB

soon in Europe as a pilot project. Battelle is launching a large-scale study in this country over the next several years to determine their actual feasibility.

Darwin claims that the cards

could have an enormous future in all kinds of payment transactions for merchants, hospitals and industry, and could also be useful for inventory control, ticketing and record management.

In between purchases, you'll be able to use the card as a free-standing, subminiature computer ... to check on your bankruptcy status, no doubt.

—Philip L. Harrison



FINE AND DONDI

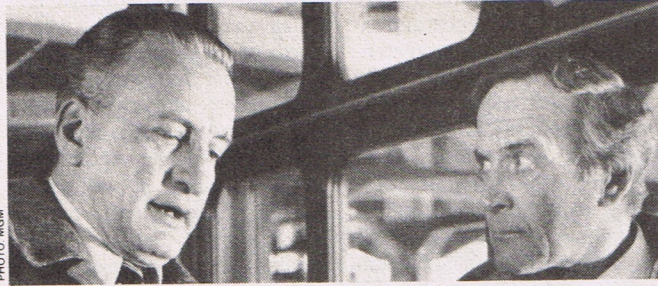
## DOWN IN THE DUMPS

It's one thing for the big oil companies to attack the movie studios, but it's quite another thing when the big chemical companies start dumping on *Dondi*.

For eight weeks, in December and January, the syndicated comic strip told the story of Dondi, the perennial 10-year-old, thwarting hired thugs in their attempts to illegally dump hazardous chemicals around his town. After the strip started running in hundreds of newspapers around the country, creator Irwin Hasen received a phone call from Dow Chemicals.

"They just wanted to straighten me out," Hasen told FUTURE LIFE. Public relations officers for the giant chemical concern sent Hasen some materials on chemical waste dumping, outlining the steps they have taken to conform with government regulations. Their position was clearly outlined in the material, Hasen said, and it was emphasized that the company was not involved in illegal activities.

"I never mentioned a chemical



*The Formula*: The movie the oil companies didn't want you to see?

company by name, I just said they were a hired group of hoods doing this on their own," Hasen said. He added that by the time Dow got to him, the strip was already completed and in the hands of the Chicago-New York Daily News Syndicate. At that point, according to Hasen, neither he nor the syndicate felt any pressure from Dow to change the strip's content. "I wouldn't change a word of it anyway," he said.

Hasen did agree, however, to add a week's worth of story at the end of the run in which Dondi's father would explain some history behind the chemical dumpings and all the regulations recently introduced. This seemed to make Dow happy and there have been no other comments from

chemical companies or readers.

On the other hand, MGM is seething over the way some oil companies have reacted to their movie *The Formula*. Based on the novel by Steven Shagan, the movie is about oil companies secretly withholding a formula for synthetic fuel in an effort to drain consumer dollars. After the movie premiered, to mixed reviews, Shell Oil mailed copies of *Science* magazine's bad review to film reviewers in New York, Chicago and Houston.

Mobil and the Atlantic Richfield Company have also made public statements against the movie, an attempt to quell any public outcry against the companies based on the film's premise.

With the movie suffering at the box office, MGM changed their marketing technique and printed two ads in major cities proclaiming *The Formula* to be "The Movie the Oil Companies Don't Want You to See."

Richard Kahn, senior vice-president in charge of worldwide marketing, denied that the new ad campaign was a result of just Shell's actions. Shell has also stated that sending the reviews to the reviewers was not an action against the movie.

"We do, in our advertising today, make the declarative statement based on evidence submitted and put before us that the oil companies prefer people not to see this picture. We make that statement in the ad because we think people should be aware of that fact," Kahn told *Variety*.

Well, MGM's formula for sending people to the theaters failed as the movie wobbled through the Christmas season. They decided to abandon the attack against the oil companies by promoting the movie as a winning formula... combining stars Marlon Brando and George C. Scott.

—Bob Greenberger

DISNEYLAND

## FILM SHORTS

After its experiences with such less-than-blockbuster movies as *The Black Hole* and *Watcher in the Woods* (due out, possibly, this summer), one would think that Walt Disney Productions would be loathe to attempt any further journeys into the realms of science fiction and fantasy. Not so. According to a recent article in *Variety*, several science fiction and science-related film projects are in the works.

One will star popular actor Richard Dreyfuss as a young Albert Einstein. Disney reports that the film will include animation sequences illustrating Einstein's thought processes as he develops his theory of relativity.

Other projects on the drawing board include a feature film based on the Ray Bradbury novel *Something Wicked This Way Comes*, with a script by Bradbury; and *Tron*, a science fiction fantasy being produced by Donald Kushner.

ON THE AIR

## SF RADIO

**S**tar Wars fans, take note! The 1977 science fiction extravaganza has been translated to a more audible dimension, and will be coming over the airwaves beginning March 3rd, courtesy National Public Radio.

The 13-part radio adaptation will follow the familiar adventures of Luke Skywalker, Princess Leia & Co. as they battle the evil Empire in weekly half-hour segments on local NPR stations. Mark Hamill and Anthony Daniels will reappear (so to speak) in their roles as Luke and C-3PO in an expanded script by Brian Daley.

How will such a visual story be brought to radio? "We are relying on the fact that millions of listeners already have many of the visual images in their heads," says executive producer Richard Toscan. "We're trying to attract a whole generation of listeners who have been raised on visual entertainment and who think of



Daniels (left) and Hamill on the airwaves.

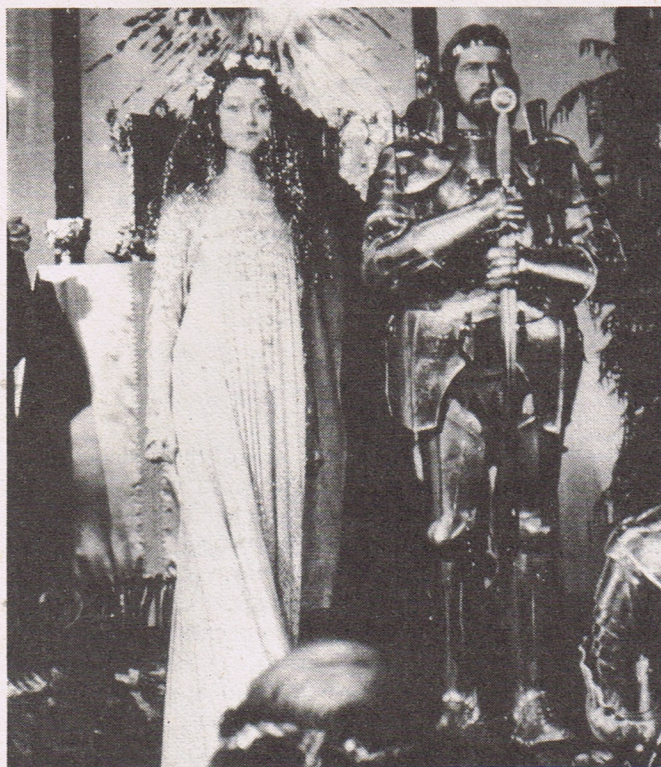
radio as something that's used only for background."

For those of you who like their universe served up in a lighter vein, *The Hitchhiker's Guide to the Universe*, that British SF satire that has already hit the U.S. in book form, will also be hitting our airwaves on NPR beginning March 6, as part of the daily drama strip, NPR Playhouse.

Originally aired in England, the popular 12-part radio show tells the tale of hapless Arthur Dent, who is rescued by an interstellar hitchhiker moments before the Earth is destroyed to make way for a galactic freeway.

Interested listeners are advised to check their local public radio stations for exact broadcast dates and times. —Barbara Krasnoff





Excalibur's wedding of Guinevere and Arthur.

PHOTO: © WARNER BROS.

#### KNIGHTFALL

### CAMELOT REVISITED

Hollywood is setting the dials on its time machine again. *Excalibur* (formerly titled *Knights*) will be transporting moviegoers back to the legendary days of King Arthur, Merlin, the fabled Knights of the Roundtable and their Quest for the Holy Grail. It will be directed by John Boorman, whose credits range from the Dave Clark Five's classic *Catch Us If You Can* to *Deliverance* to *Zardoz* to *Exorcist II: The Heretic*.

Boorman, an Arthurian enthusiast since childhood, penned the original script for *Excalibur* back in 1975. But only now, by clutching the coat-tails of *Star Wars* and other space fantasies, has the director been able to convince a major studio, in this case Orion (a division of Warner Brothers), that the tale of Camelot is ripe for today's audiences. "All storytelling," says Boorman, "has its roots in these myths, and even the modern Western and current space fantasies owe them a special debt."

To film the magic and supernatural wonders of *Excalibur*, Boorman took his actors and

production crew to the ancient sites of Ireland, from the exquisite coastline of County Kerry to the grounds of Powerscourt, famed for its cascading, 300-foot waterfall (where the momentous meeting of Arthur and Lancelot was filmed). Interiors were lensed at the Irish National Film Studios just south of Dublin.

Wanting to avoid the inherent hassles of casting big-name stars, Boorman took six months to assemble a talented, though rather unknown crew of actors, drawn largely from Ireland's Abbey Theatre, the Irish National Theatre and the Royal Shakespeare Company of England. Heading the cast are Nicol Williamson as Merlin, Helen Mirren as Morgana and Nigel Terry as King Arthur.

Wally Veevers, known for his masterful special effects in Stanley Kubrick's 2001: *A Space Odyssey*, will handle effects chores for *Excalibur*. This will mostly involve atmospheric touches such as skies, castles and other backgrounds.

(Diehard Boorman fans should watch for FANGORIA #11 and its exclusive interview with the director. The issue is on sale now.)

—Bob Woods

#### CONFERENCE

### AAS SYMPOSIUM

The American Astronautical Society will be holding its 19th Goddard Memorial Symposium on March 26-27 in Pentagon City, Virginia. The overall theme of this year's conference will be International Space Technical Applications, and it will feature a technical program and a concurrent space history program.

The technical series will feature such speakers as Dr. Charles Sheffield, Earth Satellite Corporation; Dr. Robert Hudson, NASA-Goddard Space Flight Center; and Senator (and former astronaut) Harrison Schmitt. Topics will include Space Based Earth Science Applications, In-

dustry in Space and Communications.

For the less technically minded, the space history series will consist of two sessions: one on Past Projections of Science Fiction on Space Futures; and another titled Space Science Futures: A Self-Fulfilling Prophecy? Speakers at these programs will include author Frederick C. Durant, author/editor Ben Bova and Dr. Sheffield.

Registration fees for the symposium are \$45 for members of the AAS, \$55 for non-members, and students are admitted free of charge. For further information, contact the American Astronautical Society, 6060 Duke St., Alexandria, VA 22304; telephone (703) 751-7323.

#### MEDICINE

### CANCER DETECTION

Breast cancer is, by far, one of the most dreaded diseases among women today, both for its high fatality rate and for the crippling effects of surgery. In this case, early detection is the best means to a cure, and new systems are constantly being developed to aid in the search.

The Flexi-Therm is a garment which incorporates liquid crystals (the same materials used in digital watch numbers) in a flexible sheath; thus using the patient's body heat to detect early signs of breast cancer. It is fastened to a woman's body with Velcro straps, and air encased in

the garment is released so that it conforms closely to the breasts. The liquid crystals react within minutes to the body heat, making up patterns of brown, red, green and blue. These patterns then are photographed with an ordinary camera for study by trained personnel.

While this method of detecting early signs of cancer is certainly neither foolproof nor conclusive (the changes in temperature can indicate anything from an active tumor to a benign cyst), it can prove, for many women, to be a safer method of early detection than mammography (which uses x-rays), and can be used to identify high-risk patients.

—Barbara Krasnoff

#### COMPUTERS

### MAN VS. MACHINE

Jonathan Cerf is helping to advertise a new line of computer games.

Who, you may ask, is Jonathan Cerf, and why should we care? Well, Cerf is the winner of the 1980 International Othello Tournament, and he has attributed his success at that game to frequent practice against a computer program. The program, which is called Reversal, is now being offered by the Hayden Book Company as part of their new line of computer games called Gameware.

Gameware, which according to Hayden editor Steven Radosh "features the finest microcomputer games on the market," is making its debut with three different programs: Reversal, Blackjack Master and Sargon II, a chess program. They are all priced in the \$30 range, and are slated to be in stores soon.

"[Reversal] looks ahead at literally every possible move to the end of the game and picks the best next move," says Cerf, who helped design the program. "This is something almost impossible for humans." The Hayden promotional team may want to consider a new name for their computer programs: Frustration.

—Becky Sharp



# TOMORROW'S HOUSES

Eight visionary designs from an exhibit called "Houses for Sale" show the down-to-Earth ideas of an international group of architects.

By BOB WOODS

If the family is the nucleus of society, the house is its protective membrane. The house is at the very root of our material existence, the structural womb from which we emerge each day. But the house is much more than the inanimate materials that comprise the roof and walls and floors. A house is the place where we are born and die, the place where we go back to eat and sleep, and most importantly, the house is where human interaction takes on its intimate connotations that make us so... human. Almost everyone can conjure a special feeling when thinking about the house he or she grew up in. Whether a clammy cave or a geodesic dome, *Homo sapiens* have always clung to their place of dwelling as the ultimate source of comfort and security. Be it ever so humble... a human's house is his castle.

Generically speaking, the house falls into several categories. Webster's *New 20th-Century Dictionary* starts with a simple definition— "... a building for human beings to live in..."—and goes on to spend nearly ten inches of space defining the various interpretations of "house" in our language: House of Representatives, house call, bring the house down, house of ill repute, to play house, and so on.

The quest for the ideal "dream house" has infected Earthlings since those cave-dwelling times. And every individual has his or her personal quirks about what exactly that house should be like, whether it's a simple shack or something along the lines of Xanadu, a la *Citizen Kane*. To help in the search, the perspective house owner has turned to the expert contributions of the architect to design the structure. The architect-client relationship combines the desires and specifications of the

client with the artistry and imagination of the designer. The results can be seen throughout the world in a variety of houses—from the Taj Mahal to the White House—that reflect distinctive examples of buildings suggesting grandeur and utility, grace and simplicity, but always livability.

In an unusual attempt to see what happens if their roles are reversed—whereby the architect approaches the client with his vision of a "dream house"—the Leo Castelli Gallery in New York recently invited an international group of eight prominent architects to design a modern house. (The resulting exhibit appeared last fall at the Castelli Gallery and later traveled to the James Corcoran Gallery in Los Angeles.) They were offered broad, indefinite guidelines to work around. The most confining prerequisites were that the buildings be one-family dwellings, that they be built on a single acre of land and that they cost roughly \$250,000 (after the land is bought). The project coordinators emphasized the fact that these houses should be available to prospective clients; that they could be built today; that even though they might look it, they would not necessarily be the houses of the future. Thus the title of the show: "Houses for Sale."

What the eight architects delivered is an intriguing collection of houses: some very modernistic, others rather traditional-looking, still others that might be called weird. But each reflects state-of-the-art techniques and ideas: subterranean designs, solar applications, utilization of space-age materials. Here's a look at these visionaries and what they created. And if, by chance, one of designs strikes your house-building fancy, don't forget—they're all for sale.

## ARCADIAN BERM HOUSE designer: EMILIO AMBASZ

Architect Ambasz has served as Curator of Design at the Museum of Modern Art, and was co-founder of the Institute for Architecture and Urban Studies in New York City. He has designed buildings throughout the world, and is the author of several books and scores of articles in the field.

Art critic Michael Soerkin has described Ambasz as being "... squarely in the camp of those who would reinvent architecture... He aims to take his mind, and with it his architecture, back

to building's state of nature." This observation rings true when looking at the somewhat primitive features of Ambasz's design, shown at right, and the fact that it is subterranean. His concept can be labeled visionary, with its spacey lines and solar panels, but at the same time it is quite pragmatic in its attempt to solve problems of housing and the working environment.

The walls and roof of the Berm House face north and are insulated by means of a gently terraced earth/berm (a berm is a narrow ledge, in this case formed by earth) which allows the house to conveniently blend into its surroundings. The

solar collectors are designed to cut the house's heating requirements by 70 percent or more in comparison with conventional systems. Other passive solar applications aid further in reducing energy costs.

The dwelling consists of a spacious living room, a large dining room, a studio/library, master bedroom, guest bedroom, three family bedrooms, four baths, custom kitchen, laundry room, wine cellar and an extensive number of storage areas. All the rooms open into the arcaded central courtyard. Options include a two-car garage and a swimming pond.





ALL PHOTOS ■ ART COURTESY LEO CASTELLI GALLERY

Top: Rear view of the Berm House looks into the living room. The entrance, in background, is framed by the earthen berms. Above: Aerial view shows the berms with the solar collectors and the sunken arcade/courtyard.

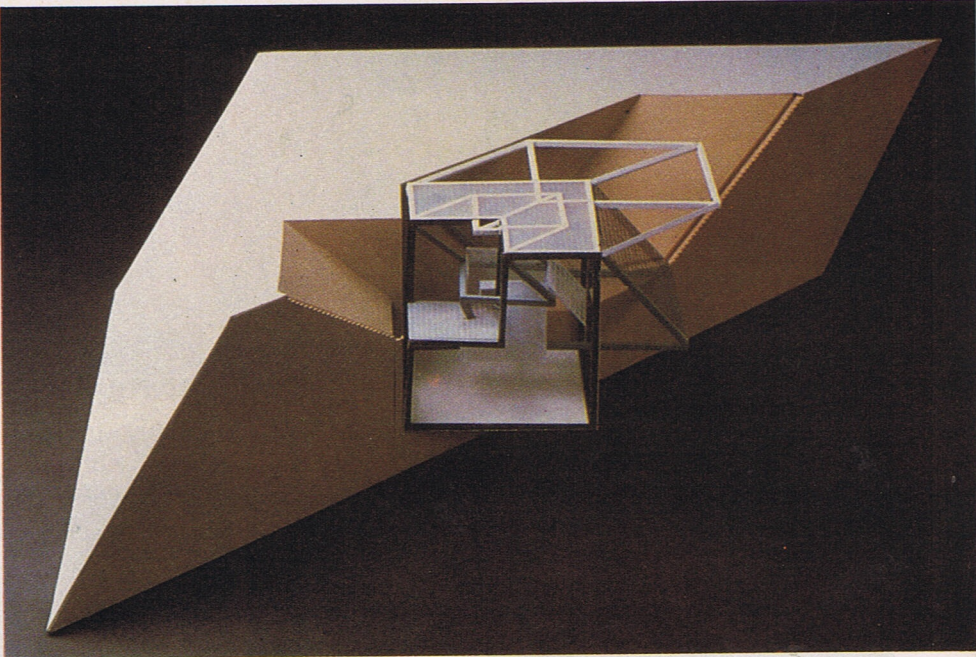


## HOUSE EL EVEN ODD designer: PETER EISENMAN

Eisenman, an architect and partner in Eisenman/Robertson Architects, is also founder and director of the Institute for Architecture and Urban Studies in New York. He has been tapped to participate in several international design competitions in Venice and Berlin. His work has been widely exhibited and is in the collections of many museums, including the Museum of Modern Art.

Of his design model, shown at right, Eisenman explains: "House El Even Odd is an axonometric object. An axonometric *drawing* is a two-dimensional reality (or three-dimensional abstraction). An axonometric *model*, as opposed to a drawing, is the transformation of the three-dimensional representation of the three-dimensional reality—it is both process and reality."

House El Even Odd is an earth-mass object, with three energy capabilities exploited: the ability of the earth to heat and cool; the natural convection of air caused by heating and cooling; and the



Axonometric model shows a section of the house set in the earth.

capacity for the sun's heat to be stored and circulated. A giant, 45-degree inclined glass plane serves as a passive

solar collector, which operates by means of openings to circulate warm and cool air, according to the seasons.

## HOUSE WITHIN A HOUSE designer: OSWALD M. UNGERS

After completing his studies in architecture at Karlsruhe Technical Institute in Germany, Ungers practiced in

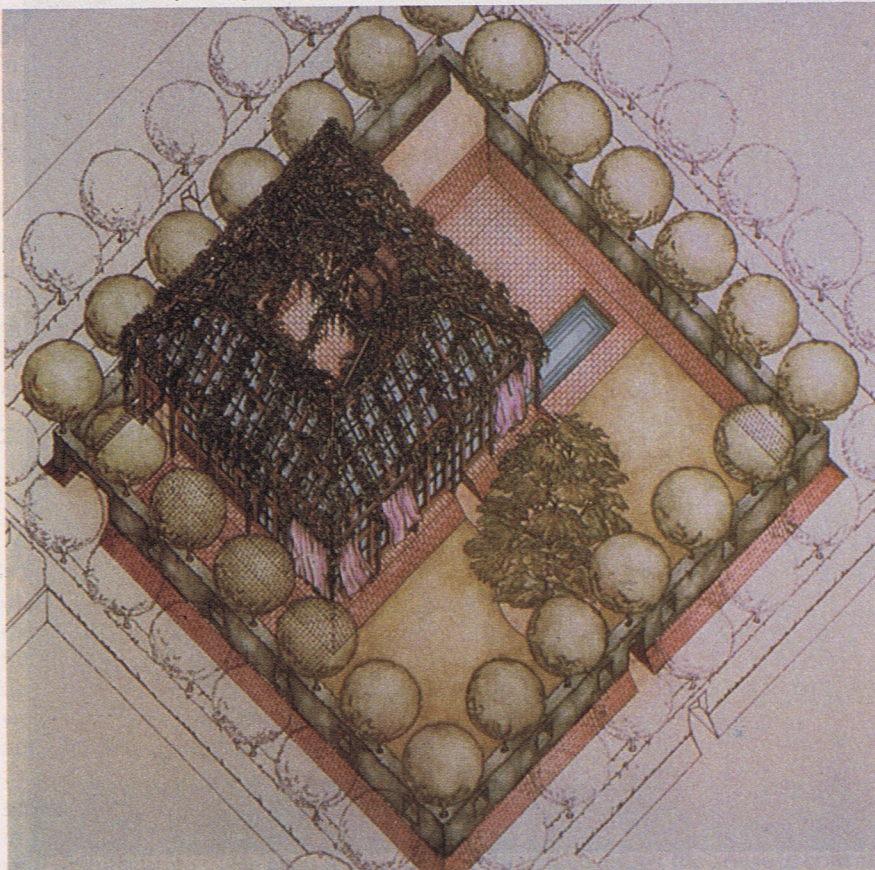
Köln, and in 1964 opened his own design firm in Berlin. In 1970 he received a license to practice architecture in New

York State and opened an office in Ithaca. He is currently serving as a full professor at Cornell University, and is a visiting professor at Harvard and UCLA. In the late '70s he conducted summer seminars on urban design.

Ungers' House Within a House is a two-story, one-family dwelling based on a square plan. Actually, there are three houses, one inside the other: an inner stone house for winter use; an enclosing glass house, a "skin" that provides cooling shade in the summer and is dismantled in winter; and a garden house which encompasses the other two structures. "The house expands and contracts," states the designer, "with the changing seasons, breathing out in warm weather, drawing inward in cold."

A passive solar energy system circulates warmed air from the greenery-house into a stone storage space under the floors. A water basin, heated by solar collectors in the basement, provides further temperature control. These two systems, in conjunction with a series of ventilators, sun screens, live plants and heat insulators make this house incredibly energy efficient.

Though the House Within a House encompasses modern knowledge of design in general and energy conversion in particular, it also draws upon architectural ideas developed in the 19th century to provide what Ungers calls "a way of living in and within nature."



Aerial view of the greenery-house in full bloom.



## HEXASTYLE TEXAS STYLE

designer: CHARLES W. MOORE

**M**oore, with a Ph.D in architecture from Princeton, has taught in his field at the University of California at Berkeley and Yale, and is presently tenured at UCLA. He is a principal in a firm that has constructed numerous projects around the country, and he is the recipient of a variety of architectural awards. His writings have been widely published.

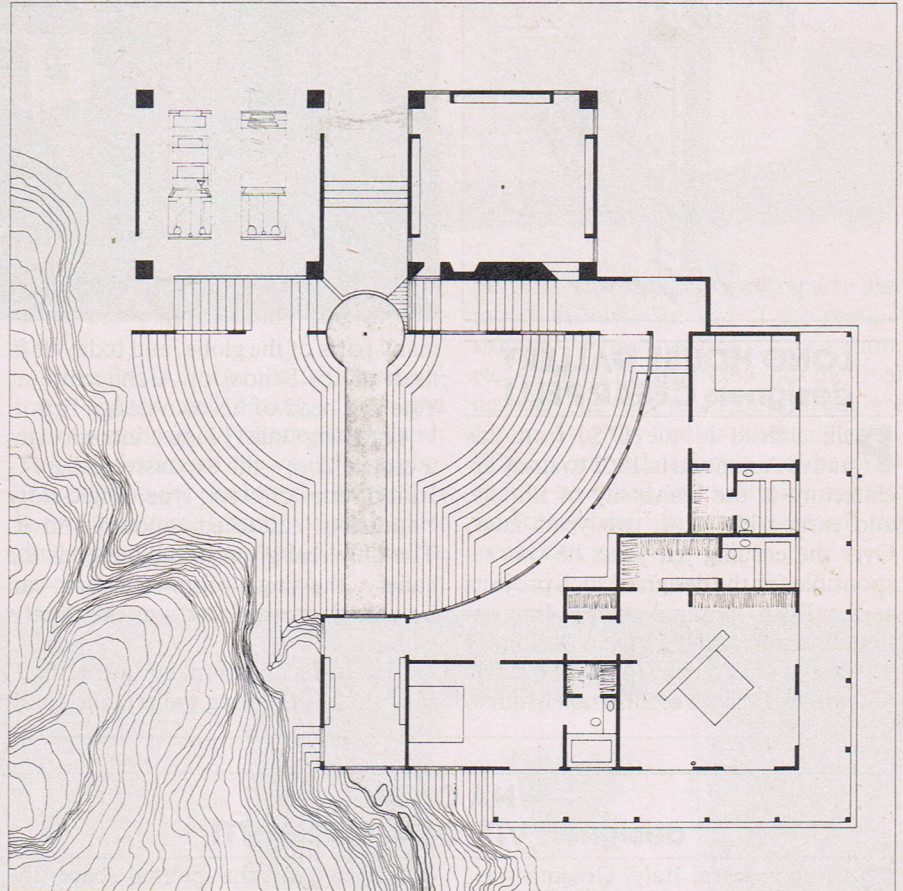
Moore's Hexastyle Texas Style (developed in collaboration with Jim Winkler and Michael Bernard) is designed to be built in, appropriately enough, Texas or other areas of the Southwest. It resembles a traditional ranch house outside, while the interior is of a more flamboyant Italian character, all organized around a semi-circular piazza.

Moore envisions his house as combining traditional elements—the ranch house and the Renaissance model—with occasional surprises. "One of the best descriptions of architecture," he believes, "is as a choreography of the familiar and surprising: the familiar to allow us to connect with the building, to feel at home in it, used to it; the surprising added for flavoring, to shock us awake, to let us look with new eyes at that familiar stuff which, without the surprising jab, might go unseen."

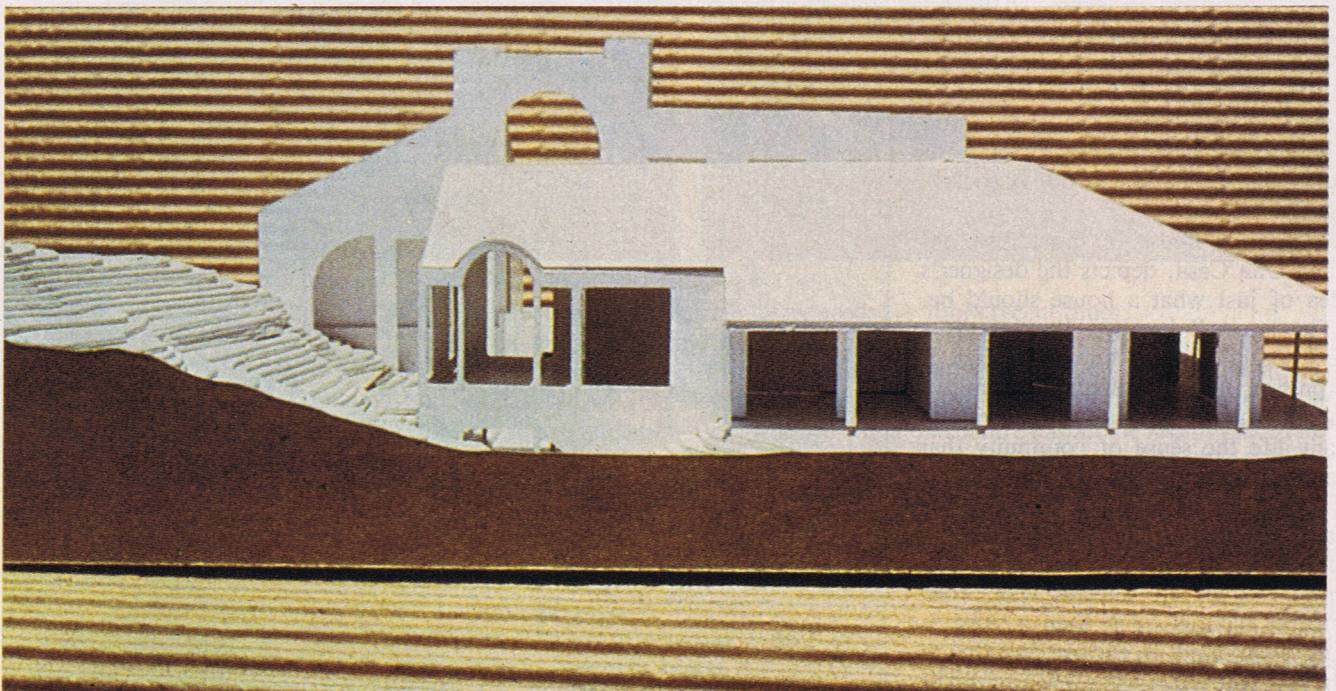
A great, curving gallery, filled with exotic plants, plus a system for venting the house, combine to make the dwelling fairly energy-efficient. Divided into pavilions, Hexastyle Texas Style has three bedrooms, a study, living room,

kitchen, dining room and a two-car garage. A sparkling streamlet meanders over the courtyard and grotto of the piazza.

The house is to be built of ordinary materials: stucco or smooth boards; a roof of metal, preferably corrugated aluminum; wood windows; 6" x 6" wooden porch posts; and a floor of concrete.

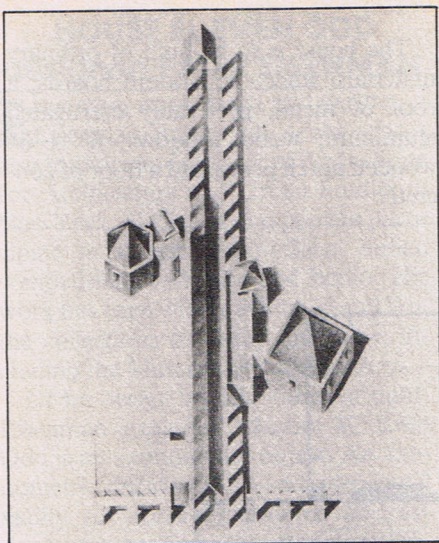


Above: Architect Moore's rendering of the main floor plan for Hexastyle Texas Style. The terraced piazza is in lower left.



View of the model is from the courtyard looking south.





## LONG HOUSE GALLERY designer: CESAR PELLI

**P**elli arrived in the U.S. from his native Argentina in 1952 to study architecture at the University of Illinois, and earned his M.A. two years later. Over the ensuing ten years he was responsible for the design of such projects as the TWA terminal at JFK International Airport and the Vivian Beaumont Theatre at New York's Lincoln Center. Since then, Pelli's work has taken him to

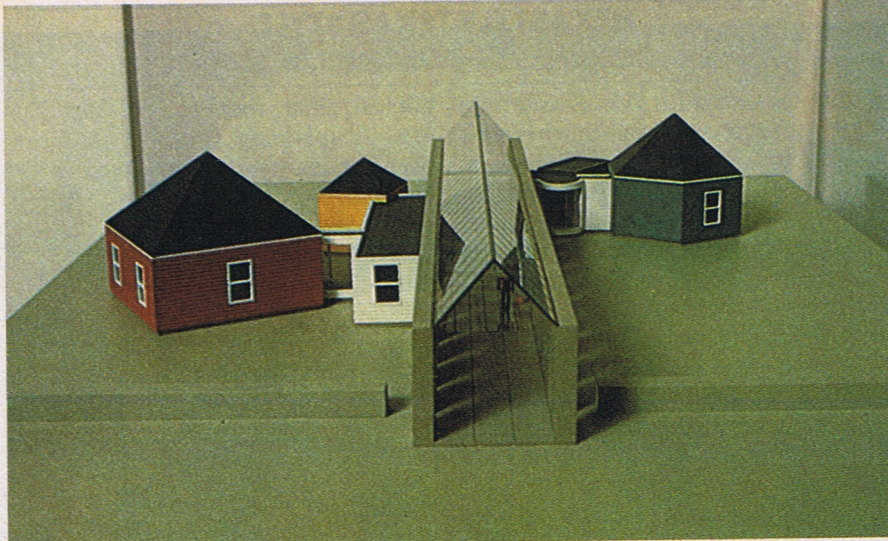
many parts of the globe, and today he is dean of the School of Architecture at Yale and head of his own design firm.

The Long Gallery House incorporates a central core—the expansive gallery—with a series of block-type, single-story “houselets” attached randomly to it. The only real given in the design is the gallery; the single-room structures can be placed—or replaced—at the client's whim.

“By being functionally unspecific,” says Pelli, “the long gallery allows all

functions to take place within it. It is in some ways like the embracing porches of my native Argentina, used for everything at all times—entrance, circulation, play, dining, even occasionally sleeping.”

The gallery is constructed of limestone or concrete left in its natural state; its sides are of glass. The attached houselets are built of wood frames with a clapboard exterior; the floors are wood or carpet and the roofs are black asbestos shingle.



## UNA CASA designer: VITTORIA GREGOTTI

**B**orn in Novara, Italy, Gregotti was, for many years, managing editor of the magazine *Casabella*, and is currently a member of the editorial committee of *Lotus*. From 1974-76 he directed the section of visual arts and architecture of the Venice Biennale. He has served as visiting professor at the universities of Tokyo, Buenos Aires, São Paulo and Lausanne. Since 1974 he has been a partner in the office of Gregotti Associati, Milan.

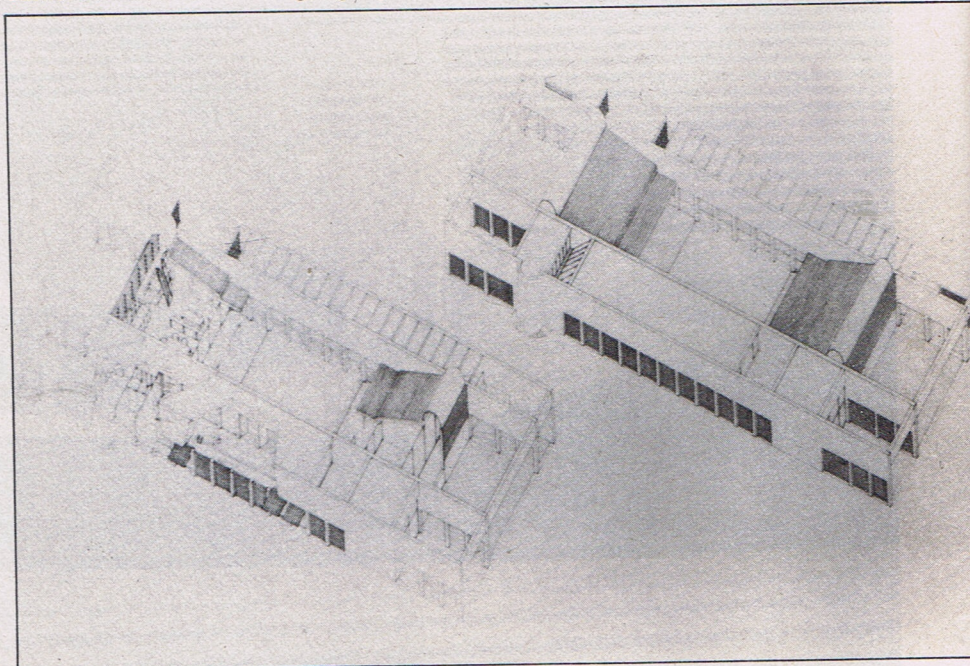
Gregotti's house of tomorrow, entitled *Una Casa*, depicts the designer's idea of just what a house should be. “The house,” he says, “represents a very special form of human habitat. It expresses in a particularly primitive manner the notion of stability, giving to daily life the sense of continuity that comes from being rooted in one spot.”

*Una Casa* is characterized by two pairs of parallel walls. The architect describes his process of building as follows: “Erect an outside wall, then another parallel to it, then a third, a fourth—to limit, to enclose, then to anchor the whole to a space that establishes a separation between the external world

(the street) and the internal space (the domain of the private person).”

The drawings shown here, according to Gregotti, portray one of many possibilities for the final ordering, a proposal

to be completed per the client's specifications. He suggests the use of light materials, wood and iron, with walls and floors of brick. He sums up his description by stating: “A work of architecture cannot adequately be described, even by drawings and photographs. It is instead an experience which only can be lived.”



Axonometric view of *Una Casa* with and without the roof.



## PLATFORMS, PAVILIONS PYLONS & PLANTS designer: CEDRIC PRICE

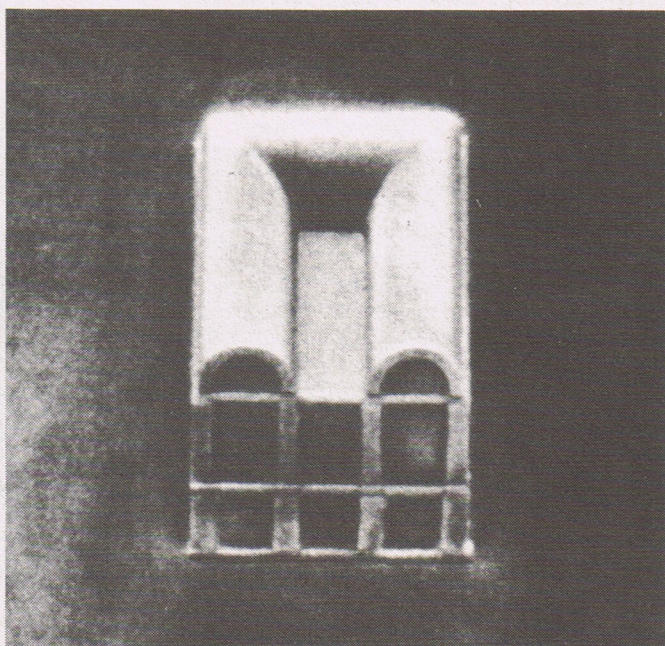
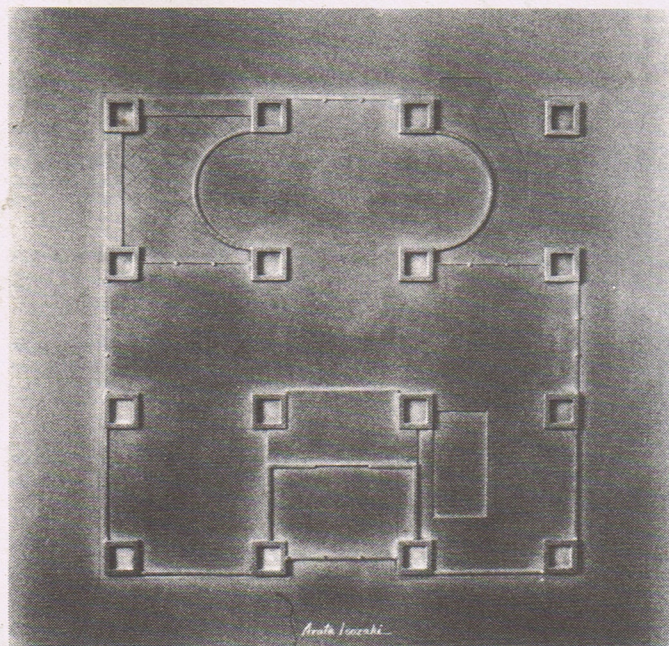
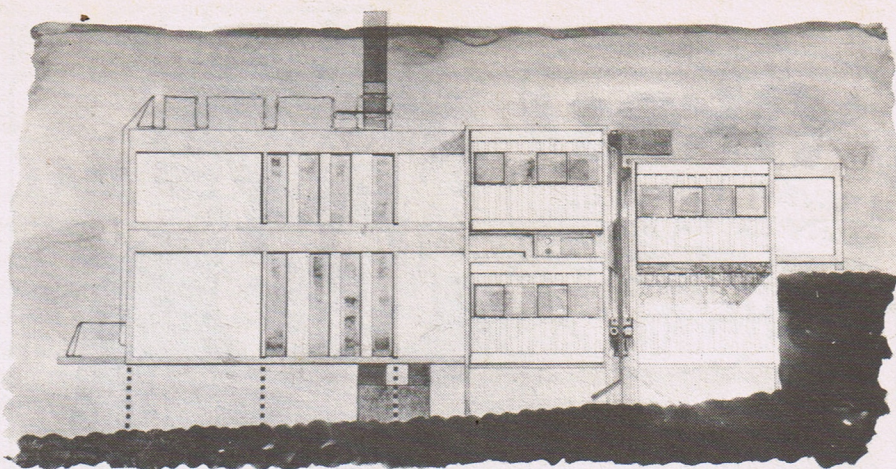
**B**ritisher Price, a member of the Royal Institute of British Architects, established Cedric Price Architects in 1960. His design work ranges from the aviary at the London Zoo to a floating breakwater for Abu Dhabi to a specialized motor bus. He also finds time to contribute to various architectural journals, and even performs occasionally on radio, television and lecture platforms, and has been a keynote speaker at many international conferences on air structures and environmental matters.

Price's approach to architecture can be called whimsical: "Security and shelter are often cited as the domain of domestic architecture, although a healthy bank balance and hotel credit cards can provide appetizing alternatives." But the house Price would build is a practical, private, family-life-oriented structure: "The family house is

as much related to isolation and solitude as to kinship, friendship and conviviality."

He calls his design Platforms, Pavilions, Pylons and Plants...and that about sums it up, all on one acre of land. The positioning of the varied components is left to the occupant's desires. It's sort of like those Lego toys; the builder can rearrange the parts to fit either the

physical surroundings or a particular mood. In turn, the use of the parts—storage, living quarters, recreation, etc.—can be incorporated into the final design. The end to Price's means are summed up by the architect as such: "Once occupied, it should look as particularly occupied and well used as your favorite shoes." In other words: If the house fits, wear it.



Left: Model of the 16 columns that make the basis for nine-squared house, shown at right.

## HOUSE OF NINE SQUARES designer: ARATA ISOZAKI

**T**his Japanese architect has taught and lectured throughout the world, and in the U.S. he has acted as visiting professor at UCLA, the University of Hawaii, Rhode Island School of Design and Columbia University. His architectural firm has designed several noteworthy structures in his native Japan.

Isozaki calls his project the House of Nine Squares. He refers to two basic qualities for the structure: 1) It must be supported by a simple spatial organiza-

tion which cannot further be reduced; 2) It must express some shape which implies "house form." Thus, its frame is composed of 16 independent columns placed equidistant to produce nine squares. This concept, according to Isozaki, is one of the most primitive attempts to represent the cosmos two-dimensionally, as it appears in the mandala drawings. As examples of other buildings utilizing this principle he offers the nine-room planning system of the classic Japanese house and the spatial organization of the villa as developed by Italian architect Palladio and others in

more recent times.

He pictures a gently rolling terrain, either on a plain or in a forest, as the ideal site for his house. The three-tiered structure has all the rooms placed in the square spaces formed by the 16 columns. He calls for the columns to be constructed of hollow precast stone, and all the exterior walls, except for those of the garage and machinery room, are to be covered with transparent glass or semi-transparent black. The roof is formed into a vault to give, in the designer's words, "a womblike space appropriate for repose."



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**ONLY A FEW LEFT!**



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#1 - Tom SAVINI and DAWN OF THE DEAD; Christopher LEE; GODZILLA'S screen history; B-Movie Mogul Alex GORDON; GALACTICA's missing aliens; Lots More!

#2 - Don COSCARELLI and PHANTASM: PROPHECY's Mutant Bear; Richard MATHESON, Pt. 1; DR. WHO article and poster; PAL'S WAR OF THE WORLDS; Much More!

#3 - CRONENBERG's THE BROOD; Stephen KING on THE SHINING film; KOLCHAK the Night Stalker articles & episodes; MATHESON, Pt. 2; Jack ARNOLD: Roald DAHL; ALIEN Poster; Tons More!

#4 - Behind the Scenes of TV's 'SALEM'S LOT; Film Femme Caroline MUNRO; Japanese WARRIOR ROBOTS & poster; Goremaster H.G. LEWIS; STAR TREK Aliens; BLACK HOLE Robots; Even More!

#5 - CARPENTER's THE FOG; John BARRY and SATURN 3; Bert I. GORDON's THE COMING; Andy PROBERT's GALACTICA Cylons; SON OF KONG; THEM!; Still More!

#6 - Sean CUNNINGHAM and FRIDAY THE 13TH; Shock FX of BOTTIN and SAVINI; Peter MEDAK's THE CHANGELING; KING-ROMERO Team-Up; Vincent PRICE on CORMAN, Pt. 1; Incredibly More!

#7 - Caroline MUNRO & Tom SAVINI—MANIAC!; Chris WALAS and GALAXINA; THE SHINING Preview; PRICE, Pt. 2; Disney's WATCHER IN THE WOODS; HITCHCOCK, Pt. 1; Animator Chuck JONES; A Great Deal More!

#8 - John CARPENTER Interviewed; Italian Shocker ZOMBIE; Jim DANFORTH & Dave ALLEN: Gary KURTZ on EMPIRE; Scatman CROTHERS on THE SHINING; Paul BLAISDELL, Pt. 1; George PAL Tribute; Good Grief, More!

#9 - Joe DANTE and THE HOWLING; David LYNCH's ELEPHANT MAN; Jamie Lee CURTIS and TERROR TRAIN; Progress on CONAN; MOTEL HELL; Alex GORDON; BLAISDELL, Pt. 2; Gaah! More!

#10 - CRONENBERG's SCANNERS; Dick SMITH and ALTERED STATES; Charles KAUFMAN's MOTHER'S DAY; MIGHTY JOE YOUNG; Tex AVERY Tribute; Jimmy SANGSTER, Pt. 1; Would You Believe—More!

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## LASE THE NUKES!

**W**e ought to make some 'Lase the Nukes' T-shirts," proposed Lockheed laser expert Max Hunter to Jim Bennett and I as we three lunched together at Max's Palo Alto hangout, the Velvet Turtle.

Thirteen years ago both Jim and I had been up to our ears organizing antiwar protests. We were outraged! Children were being napalmed, the entire Mekong Delta had been denuded by 2, 4-D (Agent Orange) and peasants were starving while B-52's cratered their rice paddies. So why were we associating with the man most responsible for the Senate Armed Services Committee's decision to commit the U.S. to a space laser anti-ballistic missile (ABM) system?

Had we repented of our fuzzy-brained leftist credos? Were we victims of the creeping conservatism of middle age? Perhaps we'd traded in our ideals for the promise of more hardware in space?

Come now. I'd never admit to imperfection. Let me explain why we veterans of the war against war should back space laser ABM.

Max's space lasers can be the velvet turtle defense. Like the turtle's shell, these defenses are designed to hurt no living thing. They would zap nuclear warheads high in space. Because of atmospheric distortions, they would be relatively ineffective against ground targets. And, like velvet, these lasers are elegant. They incapacitate warheads with surgical precision, instead of blasting energy and junk all over the place the way chemical and nuke explosives do. The most elegant thing about these lasers is that they can end our fear of nuclear terror raining down from space.

How could space laser defenses do this?

To answer that question we first need to look at why anti-ballistic missile systems have such a shady reputation. The problem with conventional ABM missiles is that each one can destroy only one—at most—enemy warhead. So the obvious response to traditional ABM systems is for the opposing side to build even more atomic weapons. Recognizing that ABM sys-

tems such as the now-abandoned Safeguard in North Dakota simply inspired more nuclear madness, in 1972 the U.S. and Soviets signed a treaty banning sea-based, air-based or space-based ABM systems.

However, a laser is forever... more or less. One space laser can keep shooting down ICBM's as long as it has energy, or until it gets shot down. Sure, the enemy could launch thousands of missiles at once, and we'd need dozens of space lasers to zap them all. If they launched tens of thousands, why, we might need tens of dozens. This arithmetic looks promising, and is the basic reason why both the U.S. and Soviet militaries have suddenly regained their interest in ABMs.

The bottom line is that with two or more nations fielding space lasers, the escalation of offensive bomber and mis-

sile systems becomes futile, like an arsonist trying to set a blaze with a match while being doused by a fire hose.

OK, I'll admit that as long as evil lurks in the hearts of men (please forgive the sexist language) we could have nuke attacks. Foreign powers could use the Armenian watermelon-smuggling network to sneak warheads inside the Soviet Union. If I wanted to nuke Tucson I'd pay a dope dealer to fly it in on his Cessna. Boy, would he be in for a surprise! But after the world's superpowers set up space ABM lasers, we need never again fear the instant outbreak of total nuclear devastation.

But wouldn't space lasers pose their own threat of Earthside destruction? Try this scene on for size. A charismatic religious leader in a black turban is whipping a crowd into a frenzy. Standing on an open balcony, he raises his eyes to the heavens and thunders, "And if what I say isn't the truth, may Allah strike me dead." Kerzap!! A regrettable malfunction, explains the State Department.

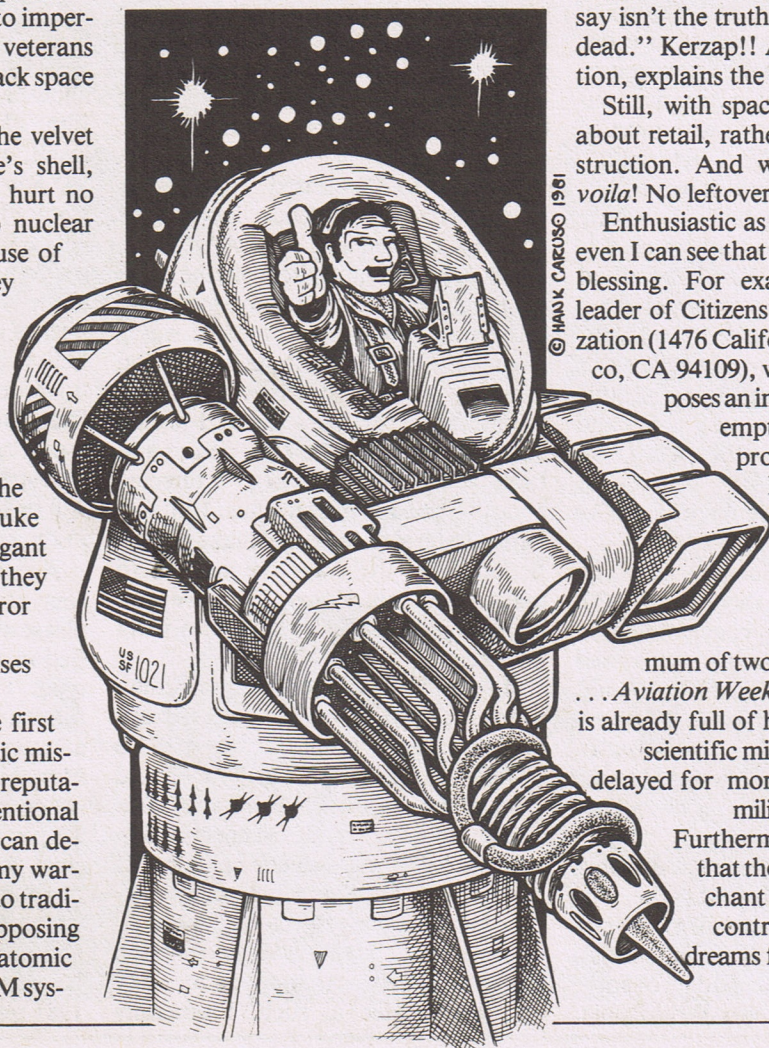
Still, with space lasers we're talking about retail, rather than wholesale, destruction. And when the war's over, *voila!* No leftover radioactive debris.

Enthusiastic as I am for space lasers, even I can see that they would be a mixed blessing. For example, Jim Heaphy, leader of Citizens for Space Demilitarization (1476 California St., San Francisco, CA 94109), warns that the military poses an immediate threat of preempting the civilian space program.

"The [space laser] proposal being pushed by Senator Wallop [R-WY] would involve 18 battle stations. Each would require a minimum of two to three shuttle flights... *Aviation Week & Space Technology* is already full of hints that civilian and scientific missions will have to be delayed for more important classified military shuttle missions."

Furthermore, Heaphy worries that the military, with its penchant for secrecy and total control, will destroy our dreams for human freedoms in

(continued on page 42)





# ROGER CORMAN

## The Director Who Ate Hollywood

By ED NAHA

**R**oger Corman is one of a kind. Director. Producer. Businessman. Corman's three-decade career in film has sparked almost as many controversies as it has films. During the 1950s, he virtually provided the then embryonic American International Pictures outfit with most of their moneymakers. His directorial approach was as energetic as it was eclectic, offering double-bill buffs everything from such low-budget thrillers as *The Undead*, *The Day the World Ended* and *A Bucket of Blood* to such pieces of exotica as *Apache Woman* and *The Viking Women and the Sea Serpent*. The 1960s found him generating classic Gothic chillers such as *The House of Usher* and *The Masque of the Red Death*, SF scenerios like *X—The Man With X-Ray Eyes* and youth culture epics such as *The Trip* and *The Wild Angels*.

Leaving directing behind him, he founded New World Pictures in 1970. Since that time, he has concentrated on producing and distributing such varied film fare as *Deathrace 2000*, *Deathsport*, *Piranha*, *Cries and Whispers*, *Breaker Morant* and *The Tin Drum*. In essence, Corman is a one-man movie machine, New World being his college of celluloid know-how.

Last year, the moviemaker took a major step. Leaping beyond the low budgets which have cramped his style for years, he created his own special-effects facility and, on a budget of some \$5 million, produced New World's big-

gest film to date: *Battle Beyond the Stars*; a self-proclaimed "*Magnificent 7* in space." Although not quite as coherent as some of its widescreen peers, the film garnered good reviews and equally pleasing box-office receipts. As a result, Roger Corman is once again diving headfirst into his first cinematic love: science fiction.

He is obviously pleased. "I've always been interested in science fiction," he enthuses, relaxing in his Los Angeles office during a brief respite from the day's seemingly endless stream of meetings. "The first film I ever produced was a science fiction film. Although I went on to work in different areas from that point, throughout my career I would constantly return to science fiction and fantasy. I would say that I've directed about 20 science fiction films. I'm very happy to be able to finally make science fiction films the way I've wanted to make them all along. I'll have solid budgets and longer shooting schedules."

Ironically enough, although Corman is regarded as a pioneer in the 1950s approach to the SF genre, it was a 1970s *wunderkind* who gave him a second crack at the subject. George Lucas' *Star Wars*, he says, made science fiction acceptable to the general public. "I think that, since *Star Wars*, science fiction has become respectable; more so than before," he says. "Science fiction was considered a faddish commodity and was treated as such. I generally

made my science fiction films for very little money because that was all I could get; usually \$100,000 or less. Our shooting schedules usually lasted from three to ten days. Later on, with films such as *X—The Man With X-Ray Eyes*, we'd be allowed three weeks to complete the film. That was considered an *epic*. As a result, we had to cut a lot of corners.

"*Star Wars*, preceded by *2001*, made science fiction bankable in terms of bigger budgets. As a result, I've been able to get some additional financing that will allow New World to delve deeper into science fiction. I won't be doing science fiction exclusively, of course. I'll continue doing a lot of different types of films. But science fiction will be a bigger aspect of New World in years ahead, and the type of science fiction we'll be doing will be bigger than the films we've done in the past."

Accordingly, Corman has three or four projects in the works that should please all types of SF fans, from science fiction die-hards to SF swashbuckler types. "In 1981," he reveals, "we'll be filming *Planet of Horrors*, which will be an interplanetary science fiction horror film. My wife will be producing Isaac Asimov's *Nightfall*. This is not so much a special-effects-laden science fiction story as a psychological one. We'll also be doing a picture that will fall somewhere between science fiction and sword and sorcery: *Kain of Dark Planet*. John Broderick is writing and directing for a 1981 release.





Machine Gun Kelly



ALL PHOTOS: AIP

The Wild Angels



Day the World Ended



PHOTO: NEW WORLD PICTURES

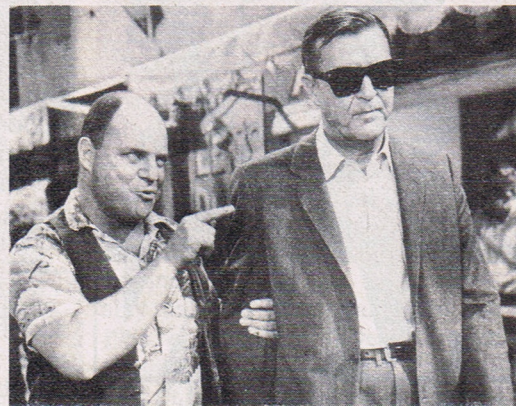
Death Sport



Bloody Mama



The Trip

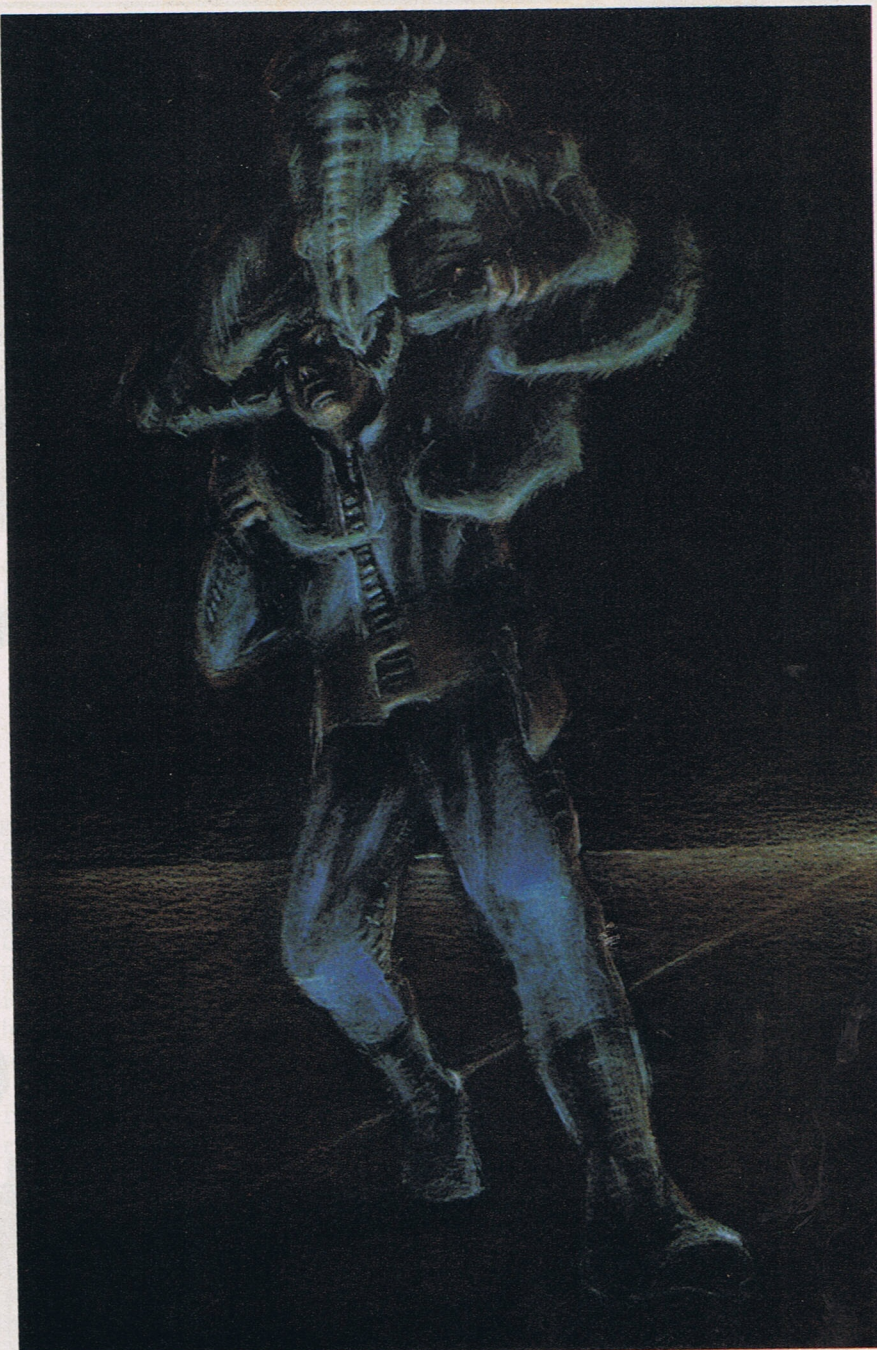


X—The Man with X-Ray Eyes



"For 1982, we're planning *Journey Beyond This Galaxy*, which will deal with a meeting between humans and a totally alien life form... far more alien than any other life force ever dealt with in any previous science fiction film. Most science fiction films allude to the fact that they feature alien civilizations but, when you actually view the film, you discover that there are strong resemblances there to human architecture, sociology, whatever. We intend to veer into the opposite direction and get into a totally alien experience... as much as any human being can. Alfred Bester, who wrote *The Demolished Man*, is doing the script for that."

Of the four pictures, the Asimov adaptation and the Bester project seem a wee bit cerebral for many filmgoers. Is Corman afraid of stressing story over special effects? "No, not at all," he smiles, the practical businessman coming to the surface. "I think that it's a very good way for us to go. Aside from the intellectual overtones, practically speaking, it's to our advantage. With our new special effects shop, we can do very, very good special effects. We proved that on *Battle Beyond the Stars*. John Carpenter, in fact, just finished using our facilities for his *Escape From New York*. Still, despite our effects and our bigger budgets, we're still limited to about \$5 million per picture. I'm pleased with what we've been able to do with that money and what it appears we will be able to do. But when you compare that sort of budget with the budgets of films like *Star Wars*, *The Empire Strikes Back*



Above: Preproduction art from *Planet of Horrors*. Left: Promo art for *Kain*.

and *Star Trek*, even our new, bigger budgets don't bring us into the bracket of the giant films.

"The idea of moving away from overt special effects on some movies and going into an area that I'll call speculative futuristic fiction is a good move for us. It will put us in a position where we can rely less on effects and more on the script, the acting and the direction. At times, you'll note, it's these areas that are ignored by some of the big-budgeted films."

Corman believes that by offering his audiences a variety of science fiction formats, he'll be able to please just about everybody. "I think audiences will be scared stiff at *Planet of Horrors*," he

says with glee. "It's a straight horror movie within a science fiction framework. Yet there's a very interesting scientific premise behind the horror so I hope that people will be both frightened and, also, intrigued by the speculative aspects of it."

"With *Nightfall*, I hope that people will be fascinated by the science fiction elements but involved by the events and the human relationships. With *Journey Beyond This Galaxy*, I hope, again, that people will be fascinated by the concept of this inter-species meeting. At the same time, I hope they will be literally overwhelmed by the spectacular special effects we're planning."



Corman stops momentarily to discuss the different stages the preproduction artwork and planning are currently in for the various films. Obviously, he is glad to be back in the science fiction realm. He's on familiar turf, although the property value of the area has changed somewhat since the days he would be called into AIP's offices, given a title and a proposed poster and told to go hire a writer and shoot a movie around the company's proposed press campaign.

"There are a few *obvious* differences between science fiction films present and past," he chuckles. "The budgets are certainly higher today, so we are able to do better work, technically. Physically, the films look better. They're bigger. There are more sets. You can spend more money on actors, writers and effects.

"Possibly, the thoughts behind the films are a little more sophisticated, but I'm not sure. I think that the thoughts behind most of the old science fiction



In the '60s, Corman directed a number of films for AIP based on the macabre tales of Edgar Allan Poe. Here he works with Peter Lorre and Vincent Price (in background) on *The Raven*.




Corman's New World Pictures brought us such movies as last year's *Battle Beyond the Stars* and 1978's *Piranha*.

films were pretty good. It's just that the severe budget limitations held a lot of people back and put a virtual stranglehold on your ideas. I know I certainly had problems along those lines."

Before rushing off to another meeting, Corman tries to put into words just why he is so delighted to be dabbling in science fiction once again. "I think it's the intellectual side of science fiction that attracts me," he begins. "Science fiction extrapolates from our world to beyond our world. It's interesting to consider what might happen in the future, what might happen on different worlds, what might happen on different levels of reality. I think this is a necessary curiosity for the human race. We must always look beyond where we are today. Whether it be Columbus saying 'We must sail the ocean' or Einstein saying 'I must go beyond the current theories in physics and math' or an artist saying 'I must create something new,' human beings must always move *forward*, wherever forward may be. I think science fiction is one way to deal with that concept. It prepares us for any and all possible forwards."

Corman's concept of forward, at this point, is out the door, down the hall and into another meeting. One last question is put to him during his exit. Does he have any surprises up his sleeve for the near future? "Well, we may do a sequel to *Battle Beyond the Stars*," he says, rushing down the hall. "Oh, I'll probably make my directorial return, not in 1981, but in 1982. I haven't directed in about ten years now and I'm getting tired of sitting around the office."

Sitting? Well, sitting forward. 



• INTERVIEW •

# Poul Anderson



PHOTO © 1981 JAY KLEIN

By MALCOLM BRENNER

**I**t is no exaggeration to say that Poul Anderson is one of the founders of modern science fiction. In a career spanning 34 years he has authored scores of novels which retain their popularity today. Unlike science fantasists, or authors who seem to take delight in destroying their characters, Anderson's writing is characterized by technical accuracy and an abiding sense of warmth and humanity. His writings in the realm of fantasy and semi-historical novels have been equally well received by his legions of fans. His latest novel, *The Demon of Scattery*, was co-authored with one of his most devoted admirers, Seattle author Mildred Downey ("Bubbles") Broxon. It has proven extremely popular.

**You started writing science fiction in 1947. How does it feel to be alive now, in 1980?**

Well, considering the alternative... It's a remarkable time to be in. We are living science fiction, compared to 30 years ago. That's not always a very happy situation...

**You're referring to some of the more pessimistic dystopian works, such as Orwell's *1984*?**

1984, as I keep trying to tell people, was not a projection into the future; it was a translation into everyday British terms what everyday life was like in the contemporary Soviet Union. At the same time, there are all these tremendously exciting things being done, discoveries being made... from that viewpoint, it's the greatest time to be alive the world has yet seen.

**Greater than the Renaissance?**

At least comparable, and probably more so. The sheer volume and rate of input is greater... perhaps too great, more than we can really handle. Of course, we associate the Renaissance with creativity in the traditional arts, which there isn't much of these days. On the other hand, the tremendous creativity of science is a balancing factor, with a considerable emotional equivalence for me.

**You mean science is coming to have a more profound impact on our emotions as well as our technology?**

I'm comparing science to the traditional arts. Genetics, nuclear physics, cosmology, what-have-you, are creations of an order as imaginative and with as much beauty as a Bach fugue or a Gothic cathedral, or any of those earlier creations.

**Do the same forces drive the creative modern scientist that drove the classical artists?**

Certainly the act of creation, especially on the highest level, must be pretty much the same in either case. It feels much the same: the intense excitement, the transcendence of oneself, the feeling of having touched on something beyond the human.

**You can speak from both points of view on that, having a very strong scientific background.**

Well, I've never been a practicing scientist; can't say I've shown any scientific creativity. But just the little discoveries and insights one makes for oneself, even if they've been done a million times before, are quite an experience, and feel very much as it feels to be writing when I'm at the top of my form, and know it.



**What sort of personal discoveries?**

Just speculations about this and that possibility in science. To some extent, I practice science as part of my profession, designing an imaginary planet from the orbit up, for instance. One keeps being surprised as the design develops, suddenly thinking, "Hey, I didn't realize that, but it's got to be *this* way." That must be an emotion comparable to that of either an artist or a scientist when working out at the frontier.

**Your background is in physics, isn't it?**

Yes, I graduated in it from the University of Minnesota in 1948.

**What was it like to be studying physics at a time when nuclear energy, having just burst upon the public imagination, was being explored?**

Very exciting. All of a sudden, *everybody* wanted to study physics. The faculty and professors were inundated. What had been a comparatively obscure and genteel subject had suddenly become academic Big Business, and the schools weren't prepared to handle it. It got hectic at times. Something of the old academic gentility and formality still survived at the graduate level. We were still pretty close to the previous great era in physics: relativity, quantum theory, wave mechanics. Simply learning about that was very exciting.

**At what point did you decide to become a professional writer, rather than a physicist?**

I wanted to be an astrophysicist. But I'd sold a few stories while I was still in college, so I thought I'd try to support myself by writing while I looked around for a position, and somehow that temporary while got longer and longer. Eventually I realized that a writer was what I was going to be, which was for the best. I would never have made a top-rate scientist; I lack the mathematical creativity. Just plugging along as a second-rater isn't very attractive.

**What did science fiction writing have to offer in 1947?**

I drifted into it, the way people so often do. When I graduated, there was a recession going on, I couldn't get a job, and didn't have the money to pursue graduate studies. So writing was the means of keeping afloat. Gradually I found myself more interested in writing than a scientific career, but there wasn't any point of transition.

**How did you get your first story published?**

Sent it in, the way anybody else does. I

sold the first two or three, then had a long string of rejections. The markets were very limited in those days, you realize; a few magazines, none of which paid very much. I was published in *As-tounding*, John W. Campbell's magazine. He was a remarkable man. When he got to know a writer's work, he would be very generous with his comments. Also, he was a fountainhead of ideas for stories. He'd get an idea and say, "Hey, this looks like the sort of thing you might enjoy writing." He didn't just want the idea parroted; he much preferred the writer take it further.

**Your latest solo book, *The Merman's Children*, is fantasy. How did you switch from hardcore science fiction to things less technical?**

**"Genetics, nuclear physics, cosmology, what-have-you, are creations of an order as imaginative and with as much beauty as a Bach fugue. . . ."**

I don't think there's any fundamental difference between science fiction and fantasy, or, for that matter, between either of them and mainstream literature. These are pretty artificial distinctions; the technical problems of writing are pretty much the same. You have to convey a good bit of imaginary information to the reader, whether it's about a planet or a fairyland or what-have-you. Other than that, it's just a matter of going ahead and telling a story; trying to find whatever language is appropriate for the particular story and mood. All fiction, or nearly all, is about people, how they react with each other as well as their surroundings, and with whatever impersonal forces may be involved.

**In *Hrolf Kraki's Saga*, you took a fragmentary bunch of myths and created a full-blooded story out of them. Why did that particular saga appeal to you?**

I'd seen in that particular saga a great story, but it seemed very badly told. A number of the Icelandic sagas are very fine literature, and I recommend them, but this one in its most complete form is not; it's pedestrian and self-contradictory in several places. There are other sources. I got interested in reconstructing what might have been the original version, and, at the same time, putting it in a form the modern reader could follow without a lot of footnotes.

**Let's take a recent example of your science fiction, your novel *Tau Zero*. Here you have a group of characters trapped aboard a relativistic starship which, due to an accident, cannot be slowed down. Does a story tend to develop more from a technical idea such as this, or from the possible reactions of your characters to such a problem?**

That would depend on the story. In this instance I got the basic notion, and it struck me as interesting—to what limits could you push this time-dilation effect? There exists an equation for relating relative speed to subjective time. I did some calculating about it, and the book was plotted mathematically. I wanted to convey some effect of this immense sweep of time and space, only how to do

that? Borrowing from Olaf Stapledon, I took one order of magnitude at a time and got the reader familiar with that, and then up another one. If you look at the book carefully, you'll see that, except for the very last few chapters, each chapter occupies a length of cosmic time approximately ten times the length of the preceding one. Given that structure, then you get interested in the people: what are they going to be doing? How will they interact with each other and with themselves? For a novel, I put quite a lot of time into getting to know my characters. I write biographies of all the main ones.

**Do they sort of present themselves to you?**

Yes, they become familiar enough, eventually, that they sometimes take over a scene.

**You find the writing doing something different from what you intended?**

Yes. You're sitting there writing, and whatever intuitive process is involved makes you realize, "Hey, this guy wouldn't, considering who he is and considering the situation, do what I had planned. He'd do something else." But subjectively, it feels almost as if they'd taken over. In which case, I let them have their own heads; you know, they're on the spot, not me! They know better.

**Do you ever try to examine those intu-**



itive processes to find out what's going on, or does that seem to destroy them?

I don't know how accessible they are, really. Generally, I give something as much conscious thought as I can. That's to provide the skeleton; the flesh has to come from somewhere else.

**There is, then, a strong element of the unconscious at work in you.**

Oh yes, whatever you want to call it.

**You told another interviewer—jokingly, I assume—that there might be more evidence for ghosts than for the possibility of faster-than-light travel. What is your approach to the area of parascience?**

One tries to be open-minded, but not open at both ends! By and large, the evidence for that ranges from poor to non-existent. There might be something there—I've had a few peculiar exper-

Just a lot of fun. It got started in the East Bay [San Francisco] area, where I live. The first tourney, which took place in somebody's back yard in Berkeley, was intended as a one-shot affair, but everyone wanted to do it again. I was at the second one, and it was a very pleasant way to spend the day, a very colorful scene. I had a lot of interest when it came to reconstructing the medieval scene.

**Given the very limited markets when you started writing, what do you see to have been the major turning points in the public's acceptance of science fiction?**

I don't think you can point to any single time or event, it was a fairly gradual matter, but we might possibly say a measure of general acceptance began around, say, 1960, perhaps? More or less concurrent with the growth of the space program. Many scientists would read science fiction somewhat as

average person looks upon science as a kind of magic... the scientists are magicians who can do anything, whether good or bad.

**Often without any consideration of whether it is good or bad... in the public's mind.**

Oh, even on quite high levels! Remember when the Nixon Administration came up with this highly publicized "War on Cancer"? As if you could solve a problem like that just by throwing a lot of money at it!

**It sometimes seems as if there's a diminishing-returns effect.**

Even in engineering, advances like going to the Moon involve new knowledge. The space program was really pushing the very frontiers of our capabilities.

The space shuttle would be a good example. It's been having these problems like protective tiles falling off. People think this has got to be incompetence; they don't realize that, for purely political reasons, the shuttle isn't half the machine it should be. You're out there at the very frontiers of capability, dealing with chemistries and metallurgies that are simply not very well understood. Of course things are going to go wrong! It's not like ordering a new model car for next year. It may one day be so, if we get there. If we had more public understanding of what science is about, we'd have more support for basic research.


**How do you contribute to that understanding?**

I would like to think that science fiction performs some services, of which probably the most important is a recruiting agent for scientists and technologists among the young. Quite a few scientists, engineers and other technicians, including a couple of Nobel Prize winners, admit that science fiction is what got them hooked on science in the first place. It gave these subjects enough glamor to carry them through all those very hard and unglamorous years of study and work.

**But doesn't this give science fiction something of a Jekyll-Hyde nature? It's also supremely escapist literature—escape from gravity, escape from Earth, escape from the solar system.**

Is it *escape*—or is it *advancement*? I don't want to take it too deadly seriously; most of it is just light entertainment, and what's wrong with that?

**Then you don't think of your work as enduring literature?**

Let's come back in a hundred years and we'll see what's survived. I think we'll be surprised. 

## **"If we had more public understanding of what science is about, we'd have more support for basic research."**

iences I can't explain, and most people have. But there's just not enough data in those cases to allow for constructing a hypothesis that there'd be any way of testing.

**Turning to your collaboration with Mildred Downey Broxon, your most recent novel, and her first, is *The Demon of Scattery*. How did you come to write it with her?**

She was telling me about her experiences traveling in Ireland, and mentioned the legend of this monster, and one thing lead to another. Bubbles knows a lot about early Ireland, and I know a lot about early Scandinavia, so the setting was obvious. We talked out the general idea, characters and so on. Of course, it helped that we had two main characters, a man and a woman, and we wrote alternate chapters from two different viewpoints.

**Are there any particular advantages or disadvantages to working with a co-author as opposed to working alone?**

That depends on the co-author! They say collaborations are like marriages—no two alike. My method with Gordon Dickson, for instance, has been completely different.

**How did you get involved with the Society for Creative Anachronism, and what is your fascination with it?**

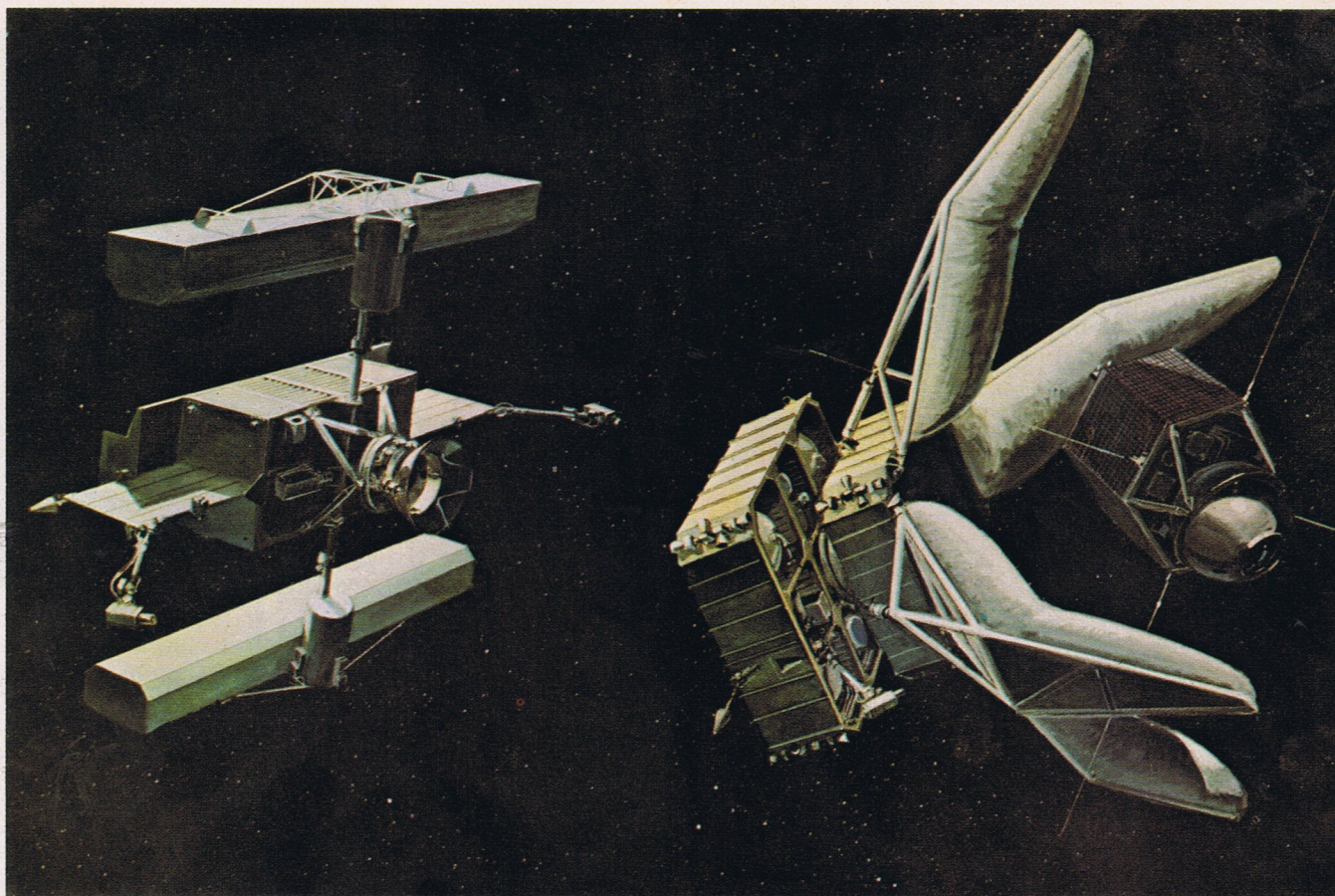
policemen read detective stories, or cowboys read Westerns. A number of early writers were scientists. A growing acceptance came partly with the growing realization that these fantastic things weren't so fantastic after all—they were rapidly becoming a part of everyday reality.

The basic concepts involved were becoming common currency, no matter how far out, sort of a latter-day mythology that everyone had a reasonable understanding of, so that the idea of extraterrestrials and what-have-you no longer seemed quite so strange. You might say it was a symbol, if you like, with a certain appropriateness for our time. Since we live in this world, which is becoming stranger and stranger faster and faster, it would seem appropriate that we cast many of our hopes and fears in such terms. There's a great public interest in science, but how much actual understanding there is, I don't know.

**Do you think the level of public understanding of science has possibly declined in recent years?**

It probably has, simply because the general standard of education has declined. When your schools are turning out functional illiterates, you can hardly expect them to be turning out graduates who have any real knowledge of physics, chemistry or biology. I'm afraid the





An ion-powered craft collects some space junk.

# TO THE STARS ON QUICKSILVER

Ion-powered rockets are no longer science fiction.

By DAVID L. NICOL

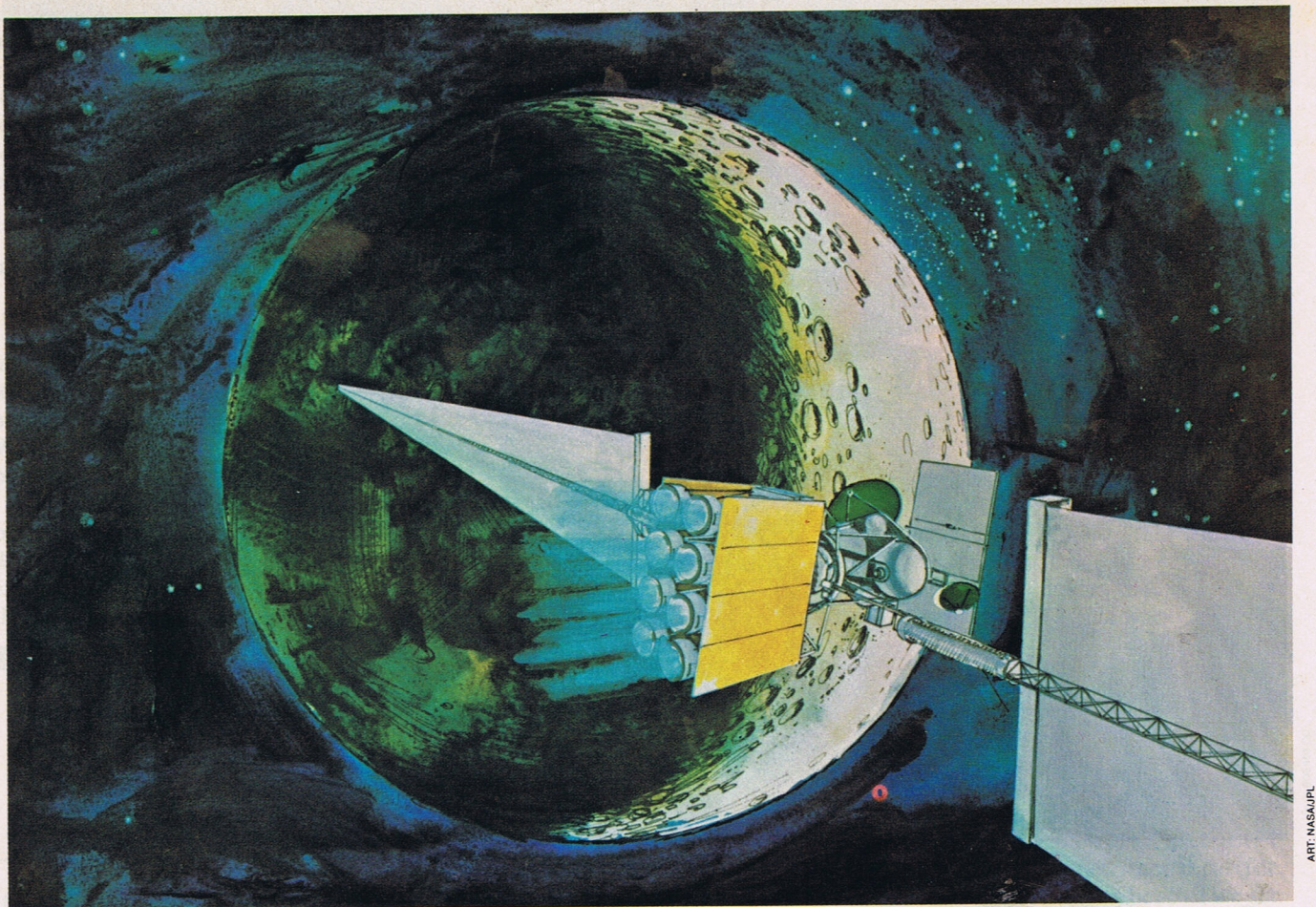
**T**he phrase "ion drive" seems to immediately conjure up images of exotic starships gliding swiftly and gracefully across the pages of a science fiction novel. But the concept of ion drive is not fictional, nor is it futuristic. It is history. Robert Goddard, the "father of modern rocketry," imagined propulsion via "electrified particles" in 1906. In 1959, Dr. Harold Kaufman designed and tested the first electric thruster at NASA's Lewis Research Center, a year before the first human orbited Earth, and a decade before the Apollo Moon landing.

Although the actual hardware lacks the glamour of its *Star Wars* counterparts, ion propulsion devices will become invaluable tools in the years of celestial exploration to come. Among the proposed missions using unmanned, ion-propelled craft are:

- Flyby and rendezvous missions to passing comets
- Retrieval of a Martian soil sample
- Reconnaissance of the asteroid belt
- Placement of an orbiter around Saturn, and a lander on Saturn's largest moon, Titan.

Ion engines, which would propel these and other vehicles through space; work unlike any rocket motor ever used before. The propellant, preferably cesium or mercury, is vaporized and sprayed into a discharge chamber. There, in a process resembling the workings of an ordinary mercury-arc sunlamp, electrons are torn from the fuel atoms, leaving a plasma consisting of charged atoms and free electrons. An accelerator grid at the aft end of the chamber then electromagnetically draws the charged atoms, or *ions*, from the plasma and hurls them out the exhaust at





ART: NASA/PL

Above: Mercury Orbiter, complete with heat shield and descent probe and driven by eight ion rockets. Below: Cutaway of ion thruster.

extremely high velocities. Any free electrons left churning about in the discharge chamber are picked up and injected into the exhaust beam to keep it, and the craft, electrically neutral. This is essential to successful operation; if neutralization does not occur, precious thrust is lost.

The electrical power needed to run such engines would be derived from 100-foot-long solar panels during flights

in the inner solar system. Farther out, beyond the orbit of Jupiter where the sunlight fails with distance, nuclear devices called radioisotope thermal-electric generators (RTGs) would take over.

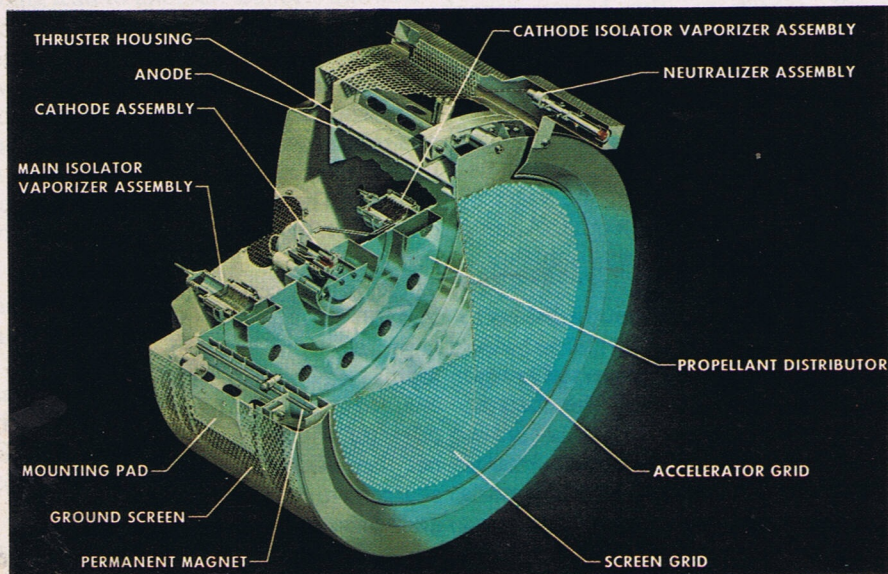
In terms of structural configuration, ion spacecraft will consist of three basic elements: the thruster module, which will house ten individual engines; the power module, consisting of solar panels, RTGs, or both; and the payload

module. Ion spacecraft will be constructed so that a wide range of automated probes can be "clipped on" to any of a large number of standardized thruster modules. This "tinkertoy" method of mating probes to vehicles will save time and money, and offer redundancy in the event of a pre-launch malfunction.

Altogether, an average probe-vehicle assembly will weigh 1,500 kilograms, and carry an additional 500 kilograms of propellant.

The primary incentive for using this unconventional approach to spacecraft propulsion lies in the efficiency of electric rockets. Surprisingly, a typical ion thruster module can do the job of a Delta rocket stage weighing five times more, and expend only one-ninth as much propellant! Why? Because ion rockets have a higher *specific impulse* than do ordinary, chemical rockets.

"Specific impulse" is the accepted measure of any rocket's efficiency. It denotes the time it takes for one pound of propellant to create one pound of thrust; and, since it concerns time, it is measured in ordinary seconds. The bottom line is that the longer it takes each pound of fuel to give up a pound of "push," the better the engine's "gas





## A tank of ion propellant the size of a TV could hurl a two-ton craft to the stars.

mileage." Put another way, the higher the specific impulse figure, the more efficient the thruster.

A Saturn V rocket, which carried our astronauts to the Moon, had a specific impulse of 265 seconds. An ion engine, however, has a specific impulse of 3,000 seconds—a figure no lumbering dinosaur of a chemical rocket could ever achieve.

Furthermore, the exhaust-gas velocity of an ion engine is very great. While fiery clouds of exploding hydrazine creep from a Saturn V at a snail's pace of 2,500 meters per second, the silent and invisible ion jet leaps from its thruster at a gut-wrenching 50,000 meters per second. This adds up to increased thrust with reduced propellant mass.

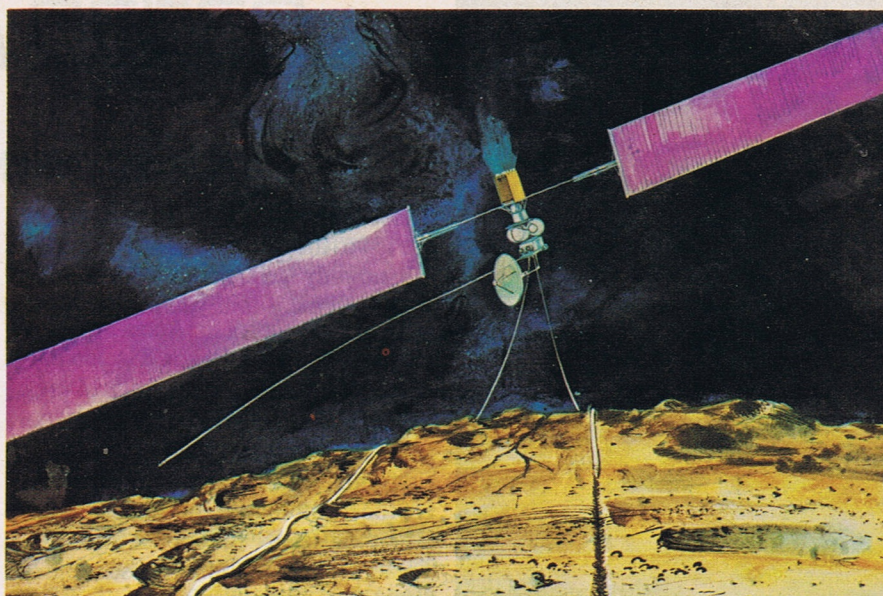
Because of this incredible "gas mileage," a tank of quicksilver propellant the size of a portable TV could hurl a two-ton spacecraft to the borders of the solar system.

Of course, ion rockets would be grossly incapable of placing payloads into Earth orbit, since they develop thrust over long periods of time. To reach escape velocity, specific impulse has to be "geared lower" to generate thrust over short periods of time. For instance, someone on a ten-speed bicycle would have difficulty climbing a steep hill in tenth gear, whereas someone else could pedal up the hill in first gear.

In the weightless environment of space, electric propulsion can make full use of its leverage. Whereas chemical rockets consume tons of fuel in just a few fiery seconds, and then *coast* to their destination, an ion thruster can apply its slight-but-steady push for months or even years without shutting down or running out of fuel, gradually shaping its trajectory as it spirals out and builds up speed. An unspectacular flight, perhaps, but effective nonetheless.

Yet despite all the arguments in favor of ion propulsion for deep space work, virtually all the hardware remains on the drawing board. Except for a few modest experimental devices in orbit, there are no electric spacecraft reaching into the stars at this moment.

"Ion propulsion," says Dr. William Hawersaat, Deputy Chief of the Flight Projects Branch at NASA's Lewis Research Center, "has been under de-



Ion-powered craft, with an on-board lab, reels in soil samples from an asteroid.

velopment for a long time. We launched SERT I [Space Electric Rocket Test] in 1964 to see how well two small, battery-powered thrusters would function in the space environment. We later launched SERT II, in 1970, to test the thruster's performance over longer periods of time. SERT II is still operational, and we're planning on testing it next year." According to Dr. Hawersaat, the reason ion propulsion has not been put to practical use so far is that, "...there have been no major development programs so far [emphasis added]...and although the thruster itself is based on off-the-shelf technology, there are still many formidable problems in constructing solar-cell arrays large enough to provide adequate power."

In December of 1979, NASA awarded \$1.15 million in "preliminary design contracts" to the Boeing Aerospace Co. and the Lockheed Missiles and Space Co. to study the possibility of an ion-powered probe to Halley's Comet in 1985. This was certainly a step in the right direction; but in 1980 Congress cut funds so drastically that NASA was unable to continue, and had to scrap the Halley's Comet mission.

Right now, NASA's Jet Propulsion Laboratory is designing a spacecraft specifically for cometary exploration. Although it is too late to intercept Halley's, researchers hope to rendezvous with other comets in the late 1980s and early 1990s. But again, these are only preliminary steps. As Dr. Hawersaat said of the Halley's mission, "It will take more to actually get the probe launched and on its way."

What it *will* take is prompt, decisive Congressional action to allocate the funding for research. NASA's budget

has declined sharply since its heyday in the 1960s "Moon race" era. The so-called "Space Shuttle Era" of the next two decades should see increases in federal space spending. But there is no guarantee that the fickle whims of Congress won't allow our space program to become even more anemic in the future, which could lead to the complete phasing-out of all ion propulsion research.


If the money does come through, we will see ion-propelled craft open new vistas on the universe around us:

We will get our first close-up look at a comet; a tremendous ball of ice, dust and frozen gases that quite probably holds the key to many of the mysteries surrounding the formation of our own solar system, some 4.5 billion years ago.

Another craft will carry a robotized lander to Mars, where it will scoop up a sample of Martian soil and return it to Earth. In a terrestrial laboratory, we could learn once and for all if the red planet is dead as well.

Automatic reconnaissance vehicles will scout the asteroid belt, cataloging the orbits of millions of planetoids, and tell us which ones, if any, contain precious metals needed back on Earth.

Still other probes will fan out across the outer solar system to examine other worlds hitherto seen only from a distance through the eyes of relatively crude television cameras. These things and more we *might* see, if Congress decides to cooperate.

And if they *do* cooperate, who knows? Somewhere down the road, far into the future, our great-great-grandchildren may be passengers aboard exotic, ion-powered starships, gliding swiftly and gracefully across the spaces that bridge the stars. 

ART: NASA/PL



## AN EDGE IN MY VOICE



Those have all gone off. I even returned the 15¢ to the lady who assured me in this life nobody gets nothin' for nothin'. What a cynic. I told you it was a public service.

And so to the mail at hand.

Douglas Gray of Johnson City, New York, was annoyed by the L-5 Society advertisement in *FUTURE LIFE* #20, the first issue in which my column appeared. He took umbrage at the Society's solicitation of funds to oppose the Moon Treaty. He made some very sensible observations about the arrogance of the human race in its desire to "colonize" space and compared it to the ethnocentrism of the European nations that "colonized" South America (for instance Spain, that "colonized" whole civilizations out of existence while introducing such cultural necessities as the Inquisition). He believes the Moon Treaty is a rational way to keep the lunar landscape from becoming yet another territorial imperative battlefield for the human race, and he asks my position on this question.

I must confess I know less than I ought about such an important matter. I've tried wading through mountains of L-5 material, sent to me from every corner of the globe, but most of it is so badly written and obtuse that I have never been able to work up the sufficient interest to do my homework. I have a gut feeling that any organization that seriously tries to further the space program is an okay outfit, but in the reading I also get a resonance that I've detected when dealing with Scientologists, members of Mensa, players at *Dungeons & Dragons* and suchlike role-filling games, and true believers who know with a messianic fervor that science fiction is better than any other kind of literature. It occurs to me that even as mild a querulousness as that will net me hundreds of feverish letters from L-5 proselytizers attempting to "correct my thinking" as born-again types have tried to "correct my thinking." I urge them not to bother. I'm not that firm in my concerns. Just sorta chatting idly about it, friends.

Dozens of you, like Rick Eshbaugh of Greenfield, Wisconsin, and Marc Russell of Los Angeles and Pat NoLast-Name in Minneapolis, have sent me lists of irrationalities to supplement the congeries I entered here several issues ago.

I'm saving them all up for a later column.

Dianne Channell of Santa Fe is a terrific human being who has subscribed, she says, because of my column. Her husband is also nifty, because he recommended Richard Hofstadter's excellent study *Anti-Intellectualism in American Life*, which I commend to you. She also wanted the September through January issues of *FUTURE LIFE* because her subscription started late and she wanted the columns she'd missed. Well, she's not missing as many as she thought because *FL* isn't published monthly, it's published every seven weeks, or eight times a year, so *An Edge in My Voice* appeared in August, September, November, December and February. What this means in terms of what Ms. Channell is missing, I do not know. All I know for sure is that she should write to the subscription and back number fulfillment department where yet another nameless personage will lose her request. This is what we call one of life's little challenges.

Steven Philip Jones of Cedar Rapids, Iowa, read a story of mine in another magazine, a story in which a writer tells his heirs to build dorm rooms so struggling young authors can live at his large home after he's dead, where they can write in peace and seclusion. Mr. Jones writes me to ask if the place really exists, if it's here at my house, and how he can take up residence. Mr. Jones seems to have trouble differentiating between fiction and reality. There are such places, of course, and they are called writers' retreats or workshops, but one usually has to pay, or get a grant to live in such an operation. My home ain't one of those. And though I usually have one or another of my writer-friends hanging out here in Ellison Wonderland, the operative word is *friend*. As sincere and talented and wonderful a person as Mr. Jones may be, I assure you that if he were to turn up at my door with a rucksack and a battered Royal portable, I would sic my gargoyles on him. I have spent many years finding my sanctuary, and I frankly don't want it festooned with hungry writers.

Peter & Kathleen in Seattle: I didn't write "the taste for Armageddon," whatever it is, and if I ever saw Ray Milland and Jane Wyman in *The Second Time Around* I have forgotten it.

Sitting here listening to an absolutely superb recording of Arnold Schoenberg's *String Quartet No. 2 in F-Sharp Minor, Opus 10* (1908), performed by The Sequoia String Quartet on a Nonesuch Digital pressing (D-79005). A miraculous series of musical entities that finally, in the fourth movement, surge into a kind of cosmic atonality. As appropriate for background as anything I might have selected to accompany the task of writing a column that replies to your many letters. I warn you, some of you are veering dangerously near to sanity in your remarks.

As usual, most of you can't follow simple directions. I specifically begged you *not* to write letters, to send postcards with your comments or questions simply and directly stated. So of course hordes of you wrote long and dithyrambic letters in envelopes that were cleverly sliced off when the nameless person at *FUTURE LIFE* committed a federal offense by opening mail addressed to me with some sort of berserk guillotine machine. In future, chums, I'll only answer postcards. Letters will be heaped immediately on a bonfire and you'll miss out on getting that sick attention you all seem to need.

Thank yous are herewith extended to the several hundred people who wrote in requesting the Asimov essay and followed the directions by enclosing a stamped self-addressed envelope and the words ASIMOV ESSAY on the outside.



Clarice Dickey of Hartford, Connecticut, asks me what music I listen to while writing. She read somewhere that I cannot write without music blaring. She asks if punk or New Wave is conducive to my working situation. First, she's correct. I work to music, as indicated by the reference to Schoenberg at the top of this column. Second, with the exception of Root Boy Slim and the Sex Change Band, the Lamont Cranston Band and a little Elvis Costello, I outgrew rock a long time ago and find most of the shit being listened to today so devoid of craft or message that I would sooner listen to disco, which makes me wanna vomit, so that answers *that*. (And again, I'll get a thousand letters from wimps extolling the manifest virtues of The B-52's or The Dead Kennedys or X or Red Crayola or

band stuff from the '30s and '40s; Moody Blues still holds up, Richie Havens, Return to Forever, Stevie Wonder, Mike Nesmith, Dave Grisman, Hubert Laws, Willie Nelson, Alan Price, Peter Allen; a lot of old Al Kooper stuff and a lot of old Gerry Mulligan cuts; Chick Corea, Dory Previn, Billy Joel, Dick Feller, Howard McGhee, Stephane Grappelli.

But mostly I like classical music. I won't run down the list, I'll just recommend a special nifty album that I managed to luck onto recently that you will go nuts over, if your brains haven't been turned to spackling compound by repeated exposure to The Germs, The Damned, Tortured Puppies or The Plasmatics. (These last four groups I got from Arthur Cover.) (My all-time favorite name for a group stands unchal-

postage, available directly from Tatsuo Sasaki, 5842 Henley Drive, San Diego, California 92120). You may use my name when ordering so the gentleman will know whence comes all this attention.

But my *best* working-to music are the film scores of Ennio Morricone. You may know his sound from the Sergio Leone Italian Westerns—*A Fistful of Dollars*, *The Good, The Bad & The Ugly*, etc.—but you probably don't know that he's done almost 500 film scores, songs, albums of background music, television tracks, arrangements, orchestrations, canonical and ecclesiastical works, full orchestra pieces for modern classicism, incidental music and whatall. His "sound" ranges from the dramatic exuberance of, say, *The Big Gundown*, a 1967 Lee Van Cleef oater, to the exquisite loneliness of Terry Malick's film *Days of Heaven*, for which work he was nominated for an Oscar. Morricone is my best companion when I'm deep in the world of what I'm writing.

As long as I'm performing public services, turning you on to esthetic joys you may not have encountered previously, it should be brought to your attention that if you want to sample some Morricone there is now an *Ennio Morricone Film-Score Society* that is doing an heroic job bringing back into print, at reasonable prices, many of the Maestro's best scores. So far they've issued the music from *La Cage Aux Folles*, *Bluebeard*, *Tepepa* and *The Divine Nymph*. (You can order direct, it is my understanding. So here's an address: Cerberus Records; PO Box 4591; North Hollywood, CA 91607. Again, since I'm doing the recommending, I suggest you mention my name when ordering; in that way, if you run into any glitches, which are unlikely as this is an outfit I've checked out myself thoroughly, I'll be able to assist you if something gets bollixed.)

Which probably answers Ms. Dickey's question more fully than she might have wanted. But you asked.

George Andrews of Cleveland, Ohio, writes to buttress my recommendation that you pay no attention to astrology; and he offers the Bible as support. He points out that in the Old Testament God says do not believe in astrologers, soothsayers, necromancers or the like; believe in me only. Which is keen, hav-

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## When you get angry about something that's going down, in your school, your town, your state or the world at large— DO SOMETHING ABOUT IT.

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whichever overnight hot flash has you drooling at the moment. And though I've been listening to and enjoying Captain Beefheart for more years than some of you have been extant, that does not mean I confuse the dreck Tower Records has stacked at point of entry with genuine artistry. So you need not write me trying to "correct my thinking." Arthur Byron Cover spends many of his waking—and several of his sleeping—hours trying to get me to listen to groups who run the risk of being electrocuted by their own Fenders when the Clearasil smeared over their paws and faces carries the current. And one *nuhdz* for rock in my life is enough.)

What I *do* listen to is primarily classical; a lot of old jazz heavy into Django Reinhardt, Bob Dorough, Ellington, Monk, all the early sides Miles cut on Prestige, Bird, Prez, Art Tatum; big

lenged, even with the monstrous inventiveness of the New Wave appellations. It is: JoJo & The Sixteen Screaming Niggers. Now *that's* class!

The record I urge you to order—by mail is its only current availability—is a most unusual rendering of Bach's *Partita No. 3 in E Major*, Poulenc's *Sonata* and (this is a stunner) Bartok's *Roumanian Folk Dances* (originally written for full orchestra) as performed by Tatsuo Sasaki on xylophone, with Howard Wells at the piano. I am not much one for "novelty" renditions of classical works—Tomita, for instance, bores my ass off—but Mr. Sasaki's interpretation of the Bartok *Dances* is, simply put, astonishing. I have written two new stories to this music already, and if you crave a singular listening experience I cannot recommend highly enough this album (Microsonics CG003, \$8.00 including



ing God on my side... except it seems a bit self-serving on God's part. I mean, if I were running for Supreme Deity, I'd say the same thing. Now if God had said don't believe in them and don't believe in me, believe in *yourself*, then I'd feel a lot easier about aligning myself with Him. Or Her. Or It. Or Them. Or None of the Above.

Alma Jo Williams of the James A. Baker Institute for Animal Health at Cornell University in Ithaca, New York, picks a semantic tibia with me as follows:

"In... your first column you make this statement: 'Those millions go to maintaining the status quo, also known as entropy. I am foursquare for chaos; I am anti-entropy.'

"Status quo is NOT entropy. Entropy, as understood by the physical chemist, etc., is the 2nd Law of Thermodynamics which states that matter and energy can only be changed in one direction, i.e. usable to unusable, available to unavailable, or order to disorder. As one of my Physical Chemistry instructors neatly put it, entropy is a measure of messiness. The opposite is *enthalpy* which is the extracting of useful work from the energy.

"If you are for chaos, you are *pro-entropy*. (It takes energy just to maintain the status quo. As the Red Queen said to Alice, 'You have to run as hard as you can just to stay in one place.') So much for thermodynamics."

Hmpphh!

Definition four; *The Random House Dictionary of the English Language*; page 477; column 2:



The Residents: Punk or junk?

"Homogeneity, uniformity, or lack of distinction or differentiation: *the tendency of the universe toward entropy*."

Ms. Williams is, of course, correct.

Further, deponent sayeth not.

Greg Higginbotham of Springfield, Missouri, sent along some photos taken of me when I was lecturing there four years ago, and asks how I view the ascendancy of Ronald Reagan to the throne. Apart from the small succor I derive from the knowledge that historically we go to war under Democratic presidents and have extended periods of economic upturn under Republican presidents (and Reagan believes, as did Calvin Coolidge, that "the business of America is Business"), I recall with a shiver Ronnie's instant response to the Free Speech Movement sit-ins at Berkeley in 1964, when he was California's governor and a member of the university's board of regents: he called out the troops and the police, and almost singlehandedly lit the fire that became a conflagration of student-administration confrontations for almost a decade (between January 1 and 15 of 1968 there were 221 major demonstrations involving nearly 39,000 students on 101 American campuses). Yes, it was the times, but doesn't it give *you* a momentary shiver to know that at the initial pressure point Ronald Reagan had the choice of rational negotiation and irrational force... and chose the latter?

That, and Reagan's selection of anti-ecologist James G. Watt as Secretary of the Interior (his first utterance upon being named to the post was, "I'm not against ecologists, I'm just against ecological extremists, those who would stand in the way of commercial development of unused lands") make me shudder at the idea of Bonzo's playmate in the White House. But then, I voted for Carter first time around (Anderson this time), and I was sorely disappointed; so what the hell do I know?

Richard Latimer of Dayton, Ohio, asks me to do a column on filmmaker Peter Watkins (*The War Game*, *Privilege*, *Punishment Park*) or an interview. Well, an interview isn't likely: last I heard, Watkins was in Australia and I have no plans to go tromping off to the bottom of the world unless FUTURE LIFE pays my way, which seems unlikely. But Mr. Latimer enclosed a dandy long quote from Watkins that I want to reprint here, not only to encourage you to look into his films, which are exemplars of social conscience, as well as



Reagan: America's #1 businessman.

being damned good cinema, but because it speaks to my intentions with this column. You see, when I first engaged to do these screeds, Kerry O'Quinn, one of the publishers, had some trepidation about what he termed my "frequent pessimism." He was afraid I'd unload a lot of negative vibes on youse folks and that would run sales down the tube. I tried to tell him that I'm actually a cynical optimist and that when I do a smash&grab on some subject it's usually out of a sense of viewing-with-alarm. Well, I'm not sure Kerry is complacent even now that I've been at this for seven installments. I get the feeling that he doesn't know quite how tough or lackadaisical you can be. I have faith in your ability to deny the corrupt state of the world to your own ease of existence, chums; and I know my pitiful rages won't have much effect. But as to this canard of being pessimistic, I offer Peter Watkins' comments, as published in Joseph A. Gomez's biography of the director:

"I should have thought that you would have been bloody glad that I didn't come out with a silver tray with answer 475 and say, 'Here you are, darling; go home and take this piece of dogma.'... If I were a pessimist, I would have made Laurel and Hardy reruns since 1965. I think our society is totally caught up in the abuse and misuse of these words 'optimistic' and 'pessimistic.' I don't believe that one is pessimistic to look at very



real problems that we are involved in... I think I am an optimist to talk about these problems in the sense that if I don't talk about them, it would be because I couldn't care less about humanity or the potential of mankind. But I do care very much, which I think is optimistic. I also care enough to make these films. I also care enough about your own sense of responsibility not to do what is done with you every day in your life—in education, in television—which is to force-feed you with directives, force-feed you with answers, force-feed you with directions to move—until you are zapped left, right, up and down. I won't do that to you. I will try and show you a problem as hard and as strongly as I can; but what to do about it, even if I had the answer, which I don't usually, I would never say to you. I would never reveal it. I would chew it over in my own head; because I would leave you to try to develop your own strength to find the answer."

Liz Wilderson of Leavenworth, Kansas, wants me to do a column on the Hugo Awards and asks how fans can vote for the Hugos and how they can obtain the annual list of nominees. Despite my having won seven and a half of the large metal things, I am the last guy in the world to chatter about the Achievement Awards of the World Science Fiction Convention. I won't go into any long diatribe about the Hugos and how they're awarded, save to note that Richard Lupoff has just had published through Pocket Books a splendid anthology called *What If? Vol. 1*, subtitled *Stories That Should Have Won the Hugo*; a collection that includes as strong and convincing a set of arguments for the revamping of the Hugo-awarding mechanism as any I might cobble up.

The paperback is only \$2.50 and I commend it to your attention more for the Lupoff editorials contained therein than for the stories, all of which are gems; which says a lot about how important I think Lupoff's comments are.

As for how to vote, well, all you have to do is become a member of the World Convention each year, and you automatically get a ballot. As to how to join a convention, and how to obtain a list of

the nominations as soon as they're released, well, you might care to subscribe to one of the three newsletters of the SF/fantasy world: *Fantasy Newsletter* (monthly, Paul and Susan Allen, PO Box 170A, Rochester, New York 14601, single copy \$1.95, \$15 per year), *Locus* (monthly, Charles N. Brown, PO Box 3938, San Francisco, California 94119, single copy \$1.25, \$12 per year) or *SF Chronicle* (monthly, Andy Porter, PO Box 4175, New York, NY 10163, single copy \$1.25, \$12 per year). Each of these publications will give you the address of the current WorldCon convention committee, and will keep you abreast of the selections. Vote for me. I'm greedy.

Lori Bailey of Alton, Illinois, suggests that the two books of TV criticism I wrote (*The Glass Teat* and *The Other Glass Teat*) were not enough horror for me to suffer and that I should do it, as Count Basie puts it, *one more once!* I suggest she read one more once written as the introduction to my book *Strange Wine*. It is as much update on the ghastliness of TV as I can muster in these, my declining twilight years.

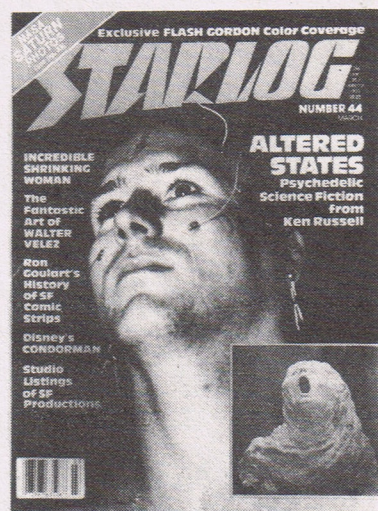
David A. Green: forget it. Roderick Sprague, Moscow, Idaho: dumb idea, forget it. James J.J. Wilson, Downers Grove, Ill.; Cadence Gainey, Hatfield, Penn.; Robert Wayne Richardson, Bristol, Tenn.; and Christy Ory, Scottsdale, Ariz.; thank you thank you thank you. You are each and every one a credit to your species. Chris Summers of Hanover Park, Illinois, and Kim Tankus of Dusseldorf, West Germany: don't send me your stories. I don't read stories submitted to me. I've already said why in a past column. Sorry to cut you off, but it ain't me, babe.

Eric Shinn of Columbia, Maryland: yes, I may have written an introduction to a book of stories by Keith Laumer, who was once my friend, but we have not been friends for a long time and the last thing in this life I'd want to do is get involved doing the screenplay for a Laumer book. As far as I'm concerned, Mr. Laumer no longer exists in my world. I'm sure the feeling is mutual. And that's how I want to keep it. Try Paul Schrader or Stirling Silliphant.

Tom Looby of Vergennes, Vermont, writes to say he read my apocalyptic introduction to *Approaching Oblivion* and he's scared about what's happening to the human race, and wants me to tell him what to do. Well, I'll tell you, Tom,

(continued on page 50)

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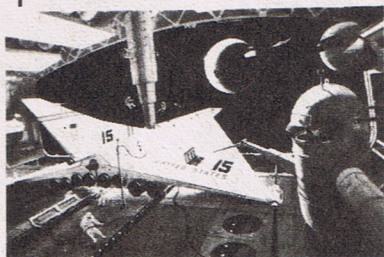
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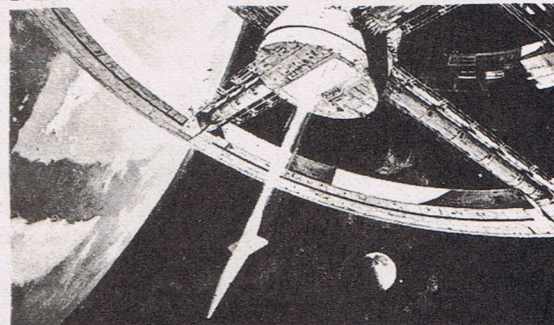
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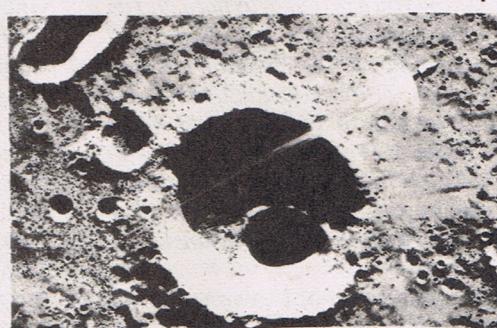
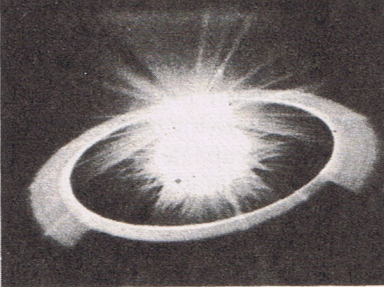
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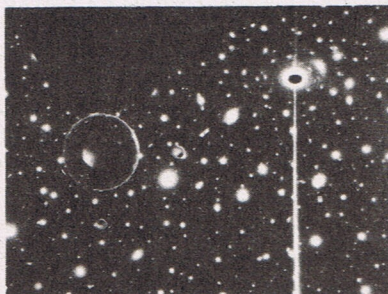
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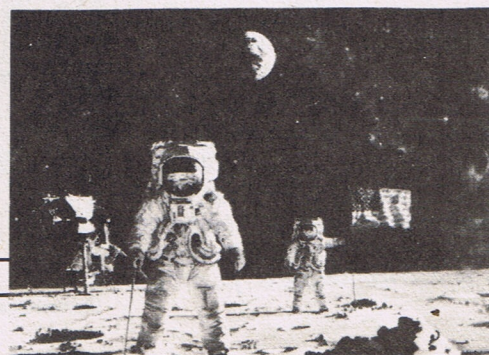


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# Thomas Boud

"I've always been interested in the imaginary world," says artist Thomas Boud. Which comes as little surprise when looking at his painting "Earth Seed" on this page and "Peer-Amid" on the following spread.

To date, most of Boud's art has been outside this imaginary realm. For the past 14 of his 36 years he's been a commercial artist and photographer. (Examples of his photographic talents will appear this summer at the Brockport, Maine, Photographic Workshop.) But his heart remains in the imaginary domain.

Unlike so many of his contemporaries in the astronomical/science fiction/fantasy art scene, Boud creates what he terms an organic effect. "I've always been into religion and philosophy. Maybe that's why my work tends to be more organic—like the work of H.R. Giger [renowned for his *ALIEN* designs]—organic and mechanical."

These sentiments display themselves in "Earth Seed." "I'm very interested in the possibility of life on this planet being started by free-borne bacteria or other life forms from other worlds. I find the

many speculations concerning the surprising speed at which intelligence seems to have evolved on this planet not at all hard to swallow. It's hard to accept that a blind, dead universe gave life to live creatures."

His intrigue for the essences of life are again evident in



ART © 1981 THOMAS BOUD

"Peer-Amid": "Here I'm trying to evoke the underlying structures of reality, not abstractly but actually." To represent his notion of reality, Boud chose three basic elements: the sky, which he calls substantial; the water, partially substantial; and the wall, fully substantial.

"Obviously, I'm a very visual person," understates the artist, while describing the means of inspiration for his paintings (most of which are done in acrylics, though he also enjoys using watercolors). "I get fleeting notions of images going through my mind. If something strong hits me I rush for a scrap of paper and sketch it for future inspiration. It's almost a form of writing, almost like shorthand."

Considering his commercial art, Boud states that he's done "just about everything." The most prominent display of his work can be seen on the labels of Shop-Rite brand vitamins. He's also produced art work for A&P and Topper Toys.

In the meantime, he's putting together an impressive portfolio reflecting his organic fantasies. Armed with this and a load of determination, he occasionally strikes out from his home in New Jersey to visit publishers in art-hungry New York City. (Incidentally, this is the way *FUTURE LIFE* met the artist.) He expresses his delight in the fact that science fiction and fantasy art are in such demand lately. He just hopes that his brand of imagery jives with those of the various publishers. ▮











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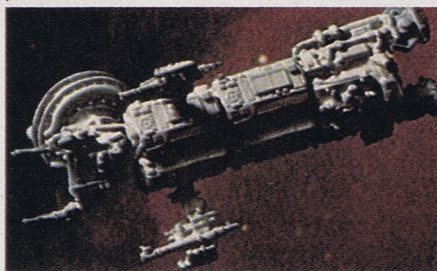
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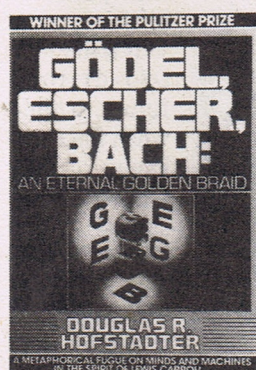


## Technotoys

### A Toy of Man's Designing

If you listen to the media moguls, you're probably expecting great things from the '80s. Everybody seems to be predicting new industrial revolutions in every field and each one is guaranteed to put the original to shame.

For example, the communications czars are promising a decade of breakthroughs that will make the late Marshall McLuhan's predictions of a global village look ultraconservative. The space



cases are just waiting for the right moment to jump off the planet and start a new era of exploration, exploitation and plenty. And the computer freaks are so confident that their only concern is that we

electronic illiterates may hold up the dawning of the new day. And that list of upcoming wonders doesn't even mention robotics, recombinant DNA or any of a half-dozen other ground-breaking technotoys that the white coats have come up with.

The computer kids' confidence isn't misplaced, though, since no matter which of the industrial revolutions turns out to be the crucial industrial evolution of the next decade, computers are going to be at the center of the action.

Publishers have noticed this and responded with a host of computer-related titles, but if you ask your local cybernut what you should read to find out what's going on, he or she will probably recommend a book that hardly mentions the infernal machines. This is **Gödel, Escher, Bach: An Eternal Golden Braid** (\$8.95 in paperback from Vintage), a first effort from Douglas R. Hofstadter.

Computer science prof Hofstadter calls this book "a metaphorical fugue on minds and machines in the spirit of Lewis Carroll." It is that, but it's also an introduction to modern mathematical logic, geometry, Turing machines, ar-

tificial intelligence, information theory, molecular biology, computer chess, computer music, diagrams for faster-than-light particles that travel backward in time, an anthill with a mind named Aunt Hillary (yes, he loves puns, acrostics, anagrams and uses them well), a pocketful of paradoxes and an almost unending series of questions that will keep you scrambling around in the back of your head for an answer.

By this point, you may well be wondering what Messrs. Gödel, Escher and Bach have in common with each other, being respectively a mathematician, a painter of impossible worlds (say two hands drawing each other) and a composer—much less what they have in common with molecular biology and the rest of that incredible (and quite incomplete) list. The key, it seems, is Gödel's Incompleteness Theorem—"All consistent axiomatic formulations include undecidable propositions." Which, simplified even further than Mr. Hofstadter cared to, is to say that the ultimate reality is always going to be just beyond your reach—something you can see in Escher's impossible worlds and hear in Bach's music. What Hofstadter does say is that playing out on the edge of what you can know or playing with the edges of what you do know, you can create beautiful things and have a hell of a good time, even if you never do get all the answers.

The book's form is almost as complicated as its title and central premise. The first half of the book is prelude to the second, just like a Bach prelude precedes a fugue. Each chapter has its own prelude, too—a series of dialogues between paradoxical characters that climaxes in a final dialogue called "The Six Part Ricercar" that includes cybernetic celebs Charles Babbage and Alan Turing, the Tortoise, Achilles, the Crab and the author in a cameo. In this turbulent closing, the author teases, teaches, puns mercilessly and, as in each of the other dialogues, sets up for a flood of embedded information.

If this sounds too relentlessly educational, don't despair. This book offers you puzzles, paradoxes, riddles and wry humor in full measure. It's guaranteed to keep you awake at night using up

reams of scratch paper trying to figure out how in the world that can be worked or this can be possible. You may be obsessed but you will be enjoying yourself.

One question that comes to mind after you've plowed through the book's 777 illuminating (and sometimes equally frustrating) pages is, after all those months on the bestseller lists, how many of the books sold were actually read? In truth, this may be joining Pynchon's *Gravity's Rainbow* and Gaddis' *JR* (not of the who-shot fame) as one of the most-bought, least-read books of the decade.

This tome takes a determined effort to start, get fascinated by and certainly to finish, but it is worth the ride. Mr. Hofstadter has put together an elegant puzzle of a book full of insights into the way we humans think, communicate, create and play and you really should take a look. If you can't resist a riddle, it's sure to hook you.

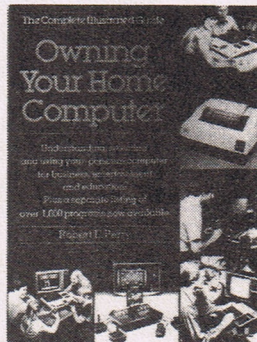
### Hands-On Experience

If you prefer to get your knowledge of the cybernetics revolution first-hand, then Robert Perry's **Owning Your Home Computer** (\$10.95 in paperback from Everest House) may be just the thing.

There have been numerous introductions to home computers, but the field is changing so fast that by the time you finish some of them they're already out of date.

Perry has produced an up-to-the-minute survey of the hardware, explained some of the basics of the evolution of the microelectronic revolution and put together a little future history of the next few years in electronics.

This isn't a book for engineers. It's a well-designed primer for the unenlightened. Perry uses a light, informative style to show you how the home com-





(continued from page 21)

space. "Carolyn," he vows, "I will fight with all my strength against this."

The father of the space laser ABM, Max Hunter, agrees that, "Ideally, it would be best not to fight." But in the meantime, while we're still trying to unravel why *Homo sapiens* uses such unpleasant manners in settling disputes, I'd just as soon lase the nukes. Nuclear war would badly depress real-estate values all over the planet, and I think it would be shortsighted to leave Earth under today's nuclear umbrella just to keep space pristine. How about taking the positive stand of demanding more space shuttles instead of letting the space laser payloads bump planetary probes and communications satellites? How about insisting on a bill of rights for space settlers, rather than simply battling the military presence because of the secrecy and coercion it often encourages?

If both the U.S. and U.S.S.R. follow through on their laser stations in space, by 1990 no nation will be free to nuke the world back to the stone age. That's Max's dream. And mine. And in the meantime, Jim's Citizens for Space Demilitarization will be doing their part to keep from becoming an armed camp under martial law. Can we get the best of both dreams?

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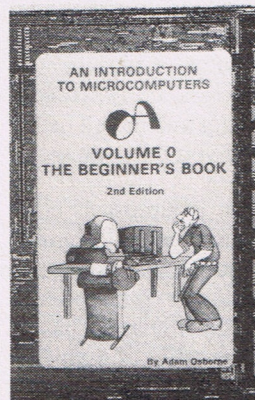
This is a book for the folks who just want to plug the machine in, plug the program in and go. This is where Perry has most of the market beat. He includes a glossary for those of us not fluent in computer jargonese and has the most complete listing of available off-the-shelf programs that I've seen.

The programs cover everything from killing Klingons to running your budget to making music. And the machines and possibilities he lists are ones that we near-penniless technodummies can cope with—and almost afford. There are machines here for less than \$200 that "speak" (in a manner of speaking) a BASIC that takes only minutes to figure out and not much longer to master.

So, if you're ready to get your hands on a home computer, here's the place.

## Getting Your Hand In

For those of you who like to tinker or just want to learn as much as you can about how these technotoys work, then Adam Osborne's *Introduction to Microcomputers, Volume 0* is just the book for you (\$4.95 in paperback from Osborne/McGraw-Hill Books).



Mr. Osborne (or his book designer) must have gotten tired of going through tech manuals with those nasty yellow highlighter felt tips to point up the important parts because all the key

points in these books are in bold type. So, if you just want to get the basics and leave the details alone, this book is great. Osborne uses *Volume 0, The Beginner's Book* to introduce you to microprocessors, basic systems, logic units, all the various memory systems, binary arithmetic, and too much of the insides of these little wonders to list without putting you to sleep.

This is a dense little book, but if you're obsessed, it can be essential. Osborne takes you where the other introductory books fear to tread and that

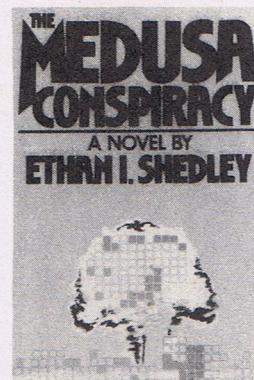
can save you from some fairly serious errors in buying a system, setting it up and figuring out what you really can do with what you've got.

## Prime Paranoid

Now, I'm sure that some of you folks are sincerely tired of writers, reviewers and various pundits beating their collective breast about this brave new world that lurks just over the horizon. Well, Ethan I. Shedley, analyst for a computer think tank, has produced a marvelous computerized cataclysm entitled *The MEDUSA Conspiracy* (\$13.95 in hardcover from Viking) that's sure to please

the paranoid in all of you.

It's the not-too-distant future, a time when the President of the United States shares the Oval Office with a computer terminal that enables him to keep on top of the



whole world situation. This is part of MEDUSA—a gigantic computer program that connects the White House to the Pentagon, CIA, NSA and the rest of the government, plus enabling American business to conduct itself at a tremendous rate.

The problem is that the system has gotten a bit glitchy—the President is getting wrong information, so wrong that the KGB and Israeli Intelligence are both trying to tell him so.

Seth Miller—a systems analyst for the company that designed MEDUSA—is called in to find out why a senator's MEDUSA terminal is sending official mail to embarrassingly wrong addresses and stumbles onto the larger problems that the President's having.

From that point on it's a paranoid's paradise complete with shadowy killers, bomb plots, men in black and a secret circle of multinational conspirators. All that plus the fun of watching Miller.

Shedley has produced a credible thriller with some very good moments all set on top of a really sinister cybernetic base. If this is the shape of things to come, then paranoids will be building even grander castles in the air.



# Doomsday May Be Cancelled

By ROBERT ANTON WILSON

The publication of R. Buckminster Fuller's new book, *Critical Path* (St. Martin's Press, 448 pages, \$17.95), is an event of historical importance, because the survival of humanity might—just might—depend on how many people read and understand what Dr. Fuller has to say.

Everybody knows that we are walking a tightrope over an abyss; that the arms race, for instance, will either bankrupt us, if we continue it indefinitely, or incinerate us, if we end it the only obvious way, by "jumping them before they jump us." Everybody knows that if either Russia or the U.S. launches its nuclear missiles, the other side will

have 20 minutes (thanks to satellite surveillance) to fire back everything they've got before they're even hit. And yet, in this no-win situation, we seem trapped. Having gotten into this highly lethal game, we don't know how to get out. We drift and stagger blindly toward Doomsday, wondering why God or history played such a dirty trick on us.

According to Dr. Fuller, this rendezvous with apocalypse only *seems* inevitable, because 99 percent of the human race believes things that simply are not so. We believe, for instance, that there aren't enough resources (matter and energy) to go around; that every group has to plot and scheme like Machiavellians to outwit every other group and get enough to survive; that this plotting and scheming is inescapable (even though obviously ever-more-dangerous-to-all) because any group that stops plotting and scheming will be jumped and plundered by one or all of the others.

Bucky Fuller roundly asserts that this whole eat-or-be-eaten philosophy (which is the unspoken belief system guiding all governments, capitalist and communist) is not partly but totally wrong. The in-

ital assumption is invalid, and every single conclusion drawn from that assumption is therefore unreal. We have created the abyss by misunderstanding the nature of the physical universe.

*There is more than enough to go around*, Fuller insists. Every "tough, pragmatic, strategic" plot and scheme based on the assumption that there isn't enough to go around is fictitious.

"It no longer has to be me or you," Fuller asserts. "Selfishness is unnecessary and henceforth unrationalizable as mandated by survival." Machiavelli is obsolete; we now have more to gain by cooperating than by plotting how to plunder each other.

Does this sound too good to be true? It should be remembered that Bucky Fuller is not some idealistic youth left over from the '60s. At the age of 85, he has nearly 70 years experience as inventor, thinker, Naval officer, architect, executive and consultant to corporations and governments. He has time and again proven that his most controversial ideas are practical and workable.

And the claim that there is abundance for all isn't Bucky's alone; it is backed up by more than 20 years of the "World Game," a computer simulation of energy-resources problems in which he has collaborated with literally thousands of other scientists and technicians. Fuller gives specific, detailed plans to implement each claim he makes (and further details are given in a companion volume, *Ho-Ping: Food for Everyone* by World Game associate Medard Gabel).

The strategy of scheming and plotting to get the jump on the other guy, then, is not "pragmatic," not "realistic," not a "necessary evil." It is a totally unnecessary evil, continued only because (as Fuller keeps repeating) 99 percent of the human race does not know the facts about the energy available on this planet.

In the last ten years, according to Fuller, humanity crossed an evolutionary threshold, unnoted by anybody except a few scientists connected with the World Game. We have arrived at the position where we know how to give everybody on the planet enough matter and energy to make them, in terms of

money, all as rich as David Rockefeller.

There is not only enough for all; there is abundance for all. And we are still plotting and scheming to bully each other out of nickels and dimes, comparatively speaking.

At this time when (after thousands of years of invention and discovery) *real* scarcity has at last been vanquished, we are maintaining *artificial* scarcity because of sheer ignorance. "Technologically," Fuller writes, "we now have four billion billionaires onboard Spaceship Earth who are entirely unaware of their good fortune. Unbeknownst to them, their legacy is being held in probate by general ignorance, fear [and] selfishness."

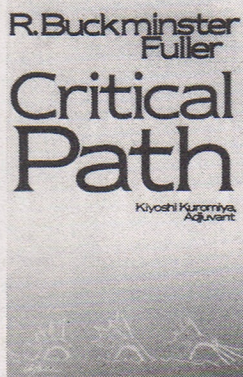
In short, humanity has already achieved, technically, the total success all Utopians ever dreamed of; our problems now are entirely due to wrong thinking. We are in the tragic-comic predicament of two crazed men dying of thirst, fighting over a teaspoon of water in the middle of a rainstorm. We cannot see the rainstorm because we are hypnotized by emergency-reflexes fixated on the teaspoon.

(Specifically, Fuller indicates, for instance, that investment in nuclear energy has made our corporate elite unwilling to see, hear, think or know anything about the much safer, cheaper and more abundant energy available by utilizing solar power to the utmost and interconnecting our electrical networks worldwide.)

Of course, it is impossible to review adequately a book like *Critical Path*, in which every word in its 448 pages has been carefully chosen by a mind of genius to convey maximum information with maximum precision. All I can add is that, while I got my review copy free, I intend to buy ten more copies of *Critical Path* and send them to ten of the most intelligent people I know.

Our future depends on how many people understand what Fuller is saying.

*Robert Anton Wilson, PhD, is a director of the Institute for the Study of the Human Future in Berkeley, Cal., and the author of several science-fiction novels including Illuminatus (with Robert Shea) and the Schrödinger's Cat trilogy.*





# OUTLAND

Director Peter Hyams explains the varied aspects of this new SF thriller, the first entry from the (Alan) Ladd Company.

By ED NAHA

**O**n the desolate moon Io, a group of space miners toils listlessly under the seemingly omnipresent gaze of Jupiter itself. Housed in a technologically advanced yet decidedly grubby super-structure, the men are employed by Con-Amalgamate, a multi-national Earth corporation dedicated to the proposition that the best buck is the fastest buck.

Into this dreary world comes Federal District Marshall William T. O'Niel (Sean Connery), a determined individualist who suspects that there is something ominous about the working conditions on outpost #27. Effectively blocking the lawman's every investigative effort is Con-Am #27's bossman, Sheppard (Peter Boyle). Before too long, sides are drawn and it seems that it's O'Niel vs. the rest of Io in the search for the truth.

This fairly gritty view of the future forms the foundation for the equally hard-hitting film, *Outland*; a film due this May from writer/director Peter Hyams. *Outland* is a different type of science fiction film for a number of reasons. For one thing, it has an impressive cinematic family background. Although distributed by Warner, it is the first production of the newly created in-

dependent Ladd Company; an organization whose president, Alan Ladd Jr., was the fellow who gave the green light on such SF fare as *Star Wars* and *ALIEN* during his stay at 20th Century-Fox. (*Outland* is scheduled to be released on May 21, the date that the aforementioned films also debuted.)

Aside from its distinctive lineage, *Outland* may prove itself interesting to a number of people because of its slightly out-of-the-ordinary brand of futurism; a low-life experience as envisioned by Peter Hyams. Hyams, science fiction film buffs may recall, is the filmmaker responsible for the equally surprising film of a few years back, *Capricorn I*, a movie which put forth a "what if" scenario portraying the U.S. space program as sheer hoakum.

Currently editing *Outland* for its May release, Hyams pauses for a moment at the Burbank studio facility in California to briefly discuss the film. Surrounded by movieolas and cannisters of footage, Hyams negates the film's possible dystopian aura. He admits that *Outland* espouses a fairly grim version of the future but he doesn't think it's depressing or even far-fetched.

"*Outland* was a very conscious at-

tempt on my part to be different," he says. "I wanted to portray a specific vision of the future that, frankly, I don't find very strange at all. The most unique element of this movie may be the fact that the idea seems very feasible, both in attitude and in terms of specifics.

"Rightly or wrongly," he continues, "I came to the conclusion a few years ago that the future tends to be portrayed in movies as a series of lucite domes and people gliding across towns on conveyer belts, clad in jumpsuits that don't fit them particularly well. To me, on the other hand, the future seems likely to be a mirror of the past in many ways.

"I think the future will be a frontier. And frontiers have a certain historical consistency to them. You can read about the people who dug the Suez Canal and the people who settled the West and the people who built the Alaskan pipeline and the people who are now on the offshore oil rigs and they always seem to be the same sort of people who show up in those godforsaken places for the same reason: money.

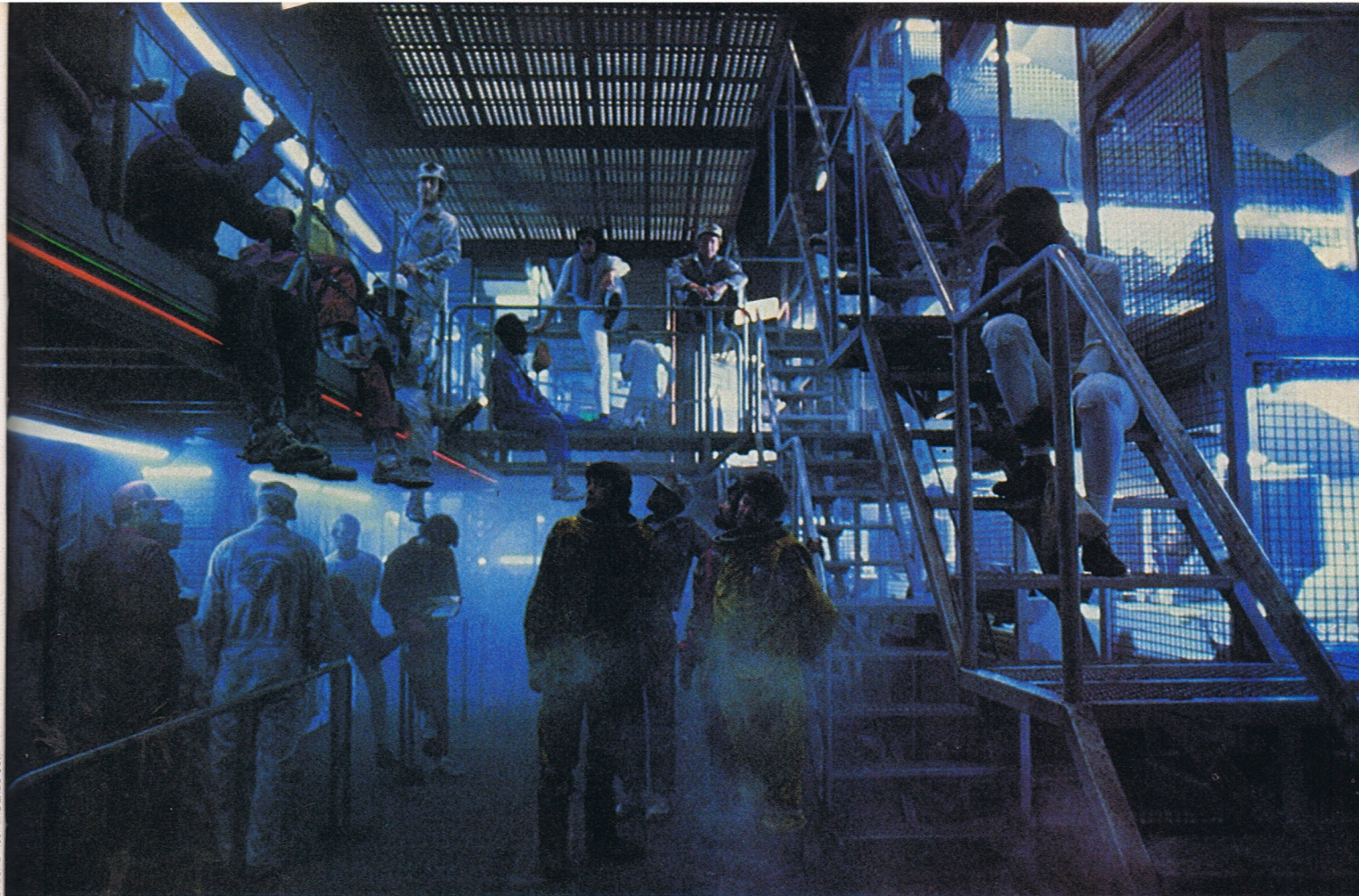
"The constant about all those places is that they were (and are) all terribly grim, terribly bleak, very rough and were put there purely for function. They also serve as good examples of how workers can be exploited. I don't think the people who run the offshore rigs or the people who started Dodge City were people who were conscious of an effort to expand the horizons of the species. They were people who realized that there was a lot of money to be made in a relatively short period of time and if they had to work under hideous conditions to make that money... so be it."

And that mercantilist ethic, in turn, led to *Outland*. "That concept struck me as interesting as far as the future goes," says the filmmaker. "I mean, what would the next step be? Where would this new frontier lead? I set this movie in a place that we could relate to, within our solar system, as close to the present time period as possible. I wanted us to have a logical reason for being there,



Pioneers in space take a break at the mining colony's bar





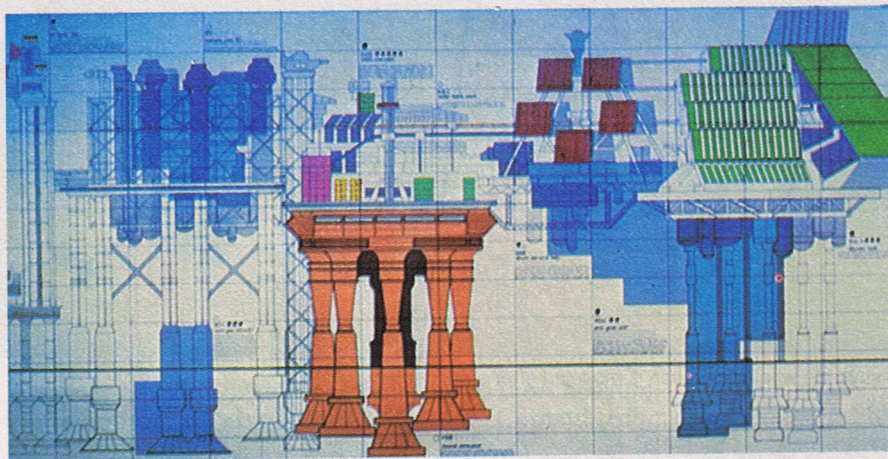
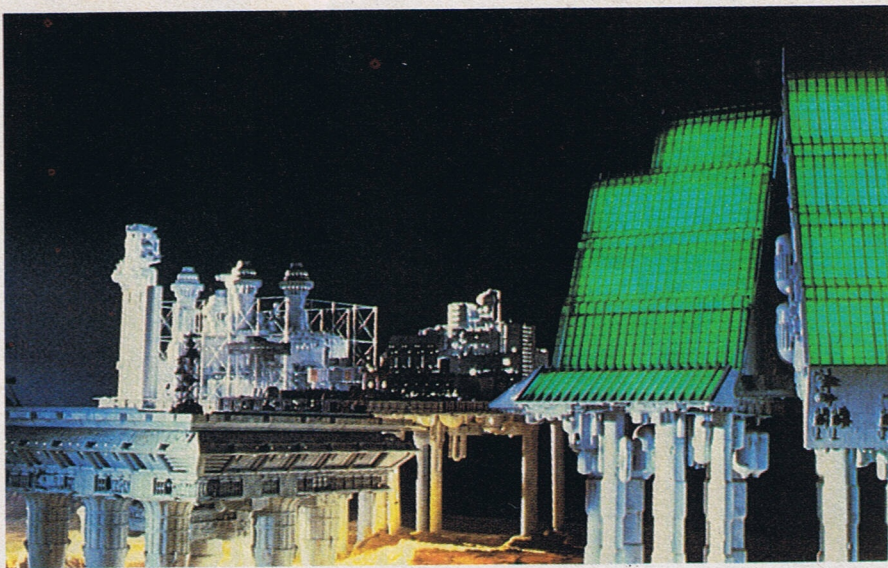
Con-Am 27's bleak-looking living quarters. Hyams says the whole operation is modeled after a penitentiary.



Above: Designer John Mollo's preproduction art for *Outland*'s spacesuits. Right: Suspectful Marshall O'Neil (Sean Connery) models Mollo's final product.







ART: © 1981 THE LADD CO.

Top and above: The working model and color schematic of the mining town, Outpost #27. Both large-scale and miniature sets had to be built for filming.

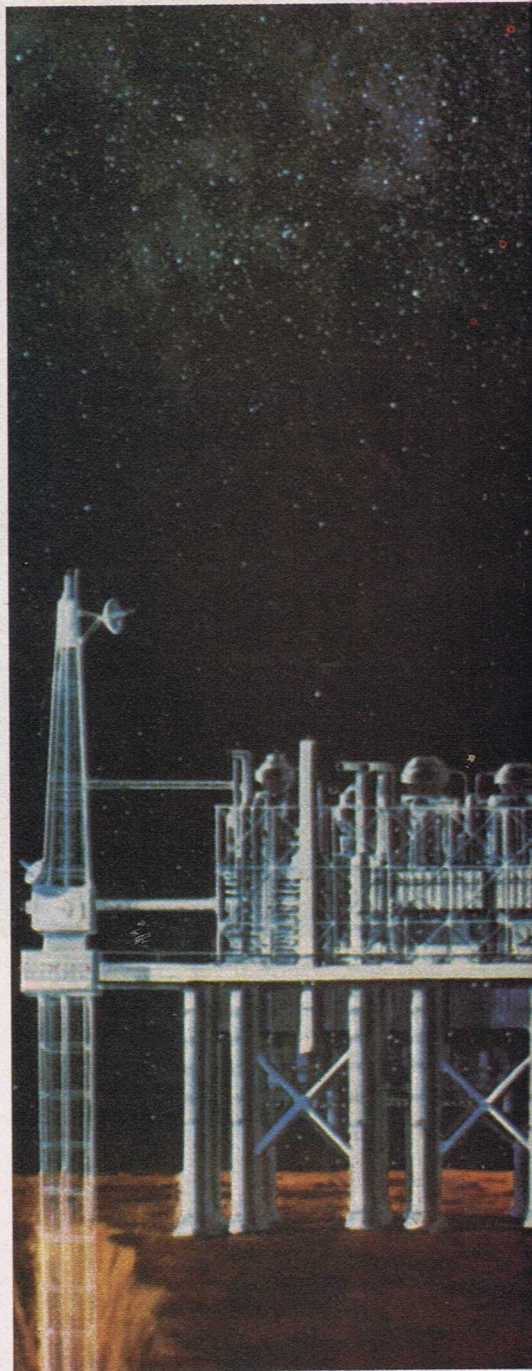
too. We're running out of fuels and resources on Earth today and, since there is a vast amount of land orbiting high above Earth, that seemed a logical place for us to go for a logical reason, to replenish our needs. Get whatever is in that ground up there, get out and ship it the hell back to Earth as fast as you can."

Taking this materialistic slant one step further, Hyams and his creative team, including production designer Philip Harrison, special effects supervisor John Stears and model makers Martin Bower and Bill Pearson, created both large scale and miniature sets, to reflect the "no frills" concept of outpost #27. "This is a rough, nasty mining town," says Hyams while looking at strips of footage, "where a multi-national corporation has a franchise to get the ore out and ship it back. Every design in this film started from function. How do you get the most amount of people in the smallest, cheapest amount of space? You cram them. This whole operation is modeled after a penitentiary. The inside

quarters are all very cell-like. The interior sets were very claustrophobic and intimidating.

"You can see the bolts in this movie. You can see the rivets. You can see the piping and the tubing. And it's all filthy. The ventilating systems don't work all the time. People sweat. Their spacesuits don't work all the time and people either freeze or broil in them. It's what I think a lot of the future's working conditions will be like: filled with vapor, grease, grime and soot."

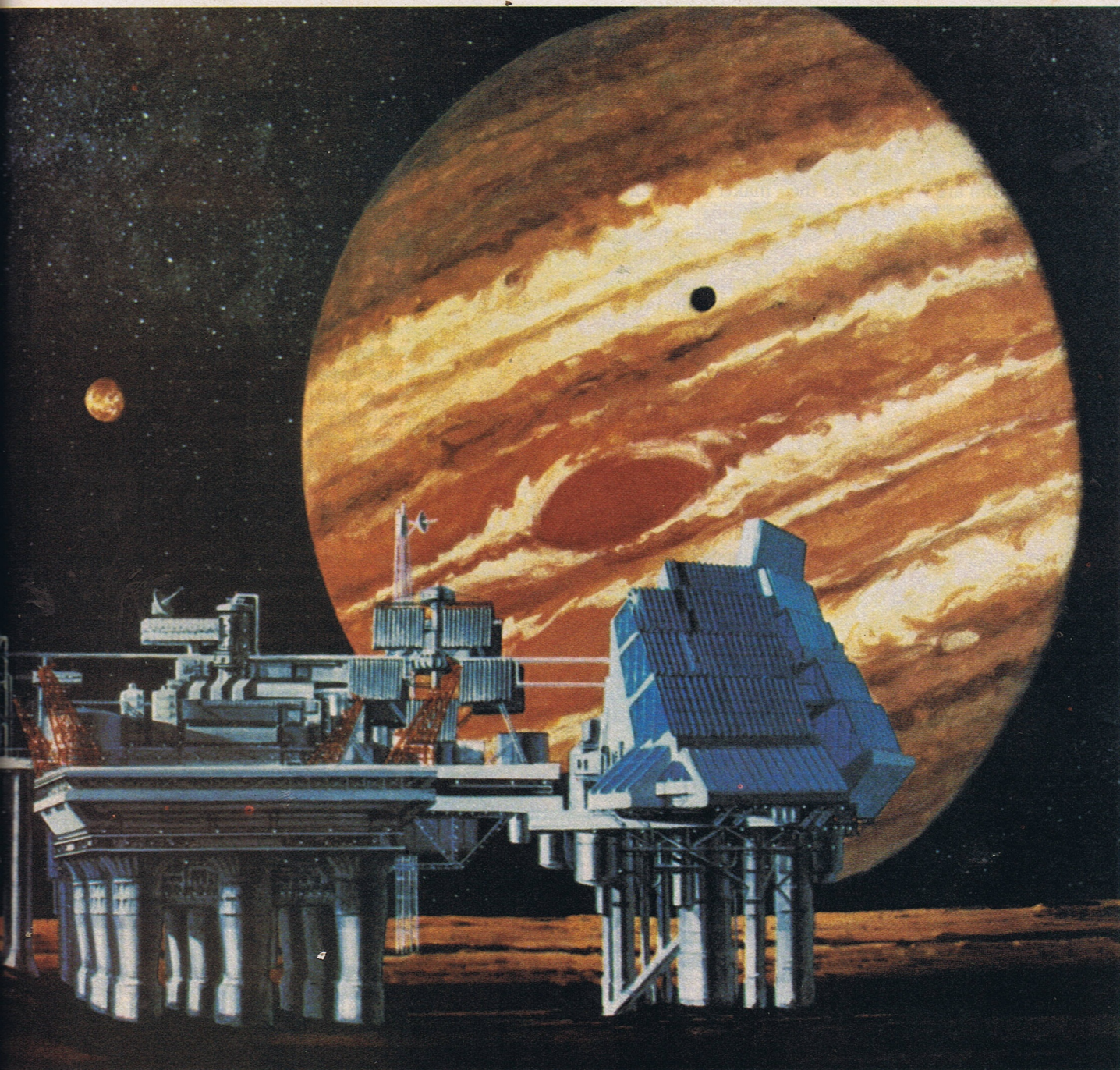
The film, which took over six months to shoot in England, centered, quite naturally, on the cramped lifestyles of the miners in this Dodge City of space and, accordingly, focused a lot of its attention on the dingy, cramped interior sets. The more Hyams shot, the more surprises his crew found in store as the actors began to actually react to their surroundings. "We experienced a few things we hadn't bargained for," the director says. "For starters, the film is just so relentlessly filthy. I don't mean sexually. I mean grimy. The production



was so relentless in its grubbiness that the people involved in it became grubby. I wouldn't allow any of the people to shave or have their hair cut less than a certain length. It began to affect everybody.

"I also had hundreds of extras stay in those quarters for three or four days before we were going to film them. What you wound up with was dirty magazines thrown all over the place, graffiti on the walls, things left in the foot lockers, posters hung up. I wouldn't allow the floors to be swept, either, so we had cigarette butts and litter all over the floor.





Designer John Mollo's original concept for Outpost #27 was executed quite faithfully. "I think this is the first film," says director Hyams, "to use the future as a location and not as the star."

"People would wind up sleeping in their quarters, with their hats pulled over their heads or a dirty book on their chests, between takes. They began to assume the pose of someone actually living in this kind of operation or in a maximum-security prison. It was very interesting. It taught us a lot about how to shoot the set, what angles to use and what to do with the people. We encouraged the actors to stay in their cubicles for as long as possible.

"It didn't hurt their morale, but it tended to slow them down. It narcosed them, actually. I mean, you'd have guys with their hands hanging over the rail-

ings playing poker while we were making a movie. It was like real life."

Real life, in turn, got to be real rough. "When you're making a movie where you're shooting 120 or 130 days," Hyams laughs, "and you're the type of guy I am... a plodder (I am one of the least improvisational people you'll ever meet in your life!), it can get strange. Luckily, I am a copious note-taker and sketcher and designer. There came a point in this film, where you just kept yourself going on impulse power and by referring to your notes—it was like a marathon. If your homework was done properly and your notes were good, then

you knew you'd be all right in the editing room later on. There were points where you found yourself muttering, 'Ummm. What's this scene? Oh, I didn't know a guy walked in there! How about that!'

"There was a major fatigue factor on this movie. I think a great deal of the success of directing a film like this has to do with physical stamina and a kind of demonic energy. I don't think you can be a well-adjusted person and do one of these films."

Despite the dirt, grime and grueling schedule, Hyams managed to hold his fictitious outpost together because of his total belief in the project. "*Outland* is a



unique science fiction film," he offers "for a couple of reasons. Sure, this particular view of the future is unique but, more importantly, I think that this is the first film ever to use the future as a location and not as the star. This is a movie about people. It has a very specific story, a very suspenseful one. It's a movie about people who are very close to the surface of violence and about a man and his family and how they react to it. We were extraordinarily lucky to have great actors to work with on this. The actors are never secondary to the hardware, either.

"Directing this film was difficult because, yes, it is an elaborate film, and yes, it is state-of-the-art because of some of the techniques employed, but first and foremost this is an emotional story. All movies are hard to do if they're done correctly. I don't think it's any harder filming *Lawrence of Arabia* than *Kramer vs. Kramer*. *Kramer vs. Kramer* is an extraordinary movie that had wonderful writing, excellent direction and brilliant acting. That's hard! The fact that mountains may not be blowing up or buildings may not be falling down doesn't make it an easy, 'little' film."

Hyams backs off from his discourse on modern film, but before turning back to his editing chores, he sums up his feel-

ings on contemporary science fiction and *Outland's* role in shaping celluloid speculation to come. "I'm interested in futuristic films," he says. "I think films dealing with the future are a staple of American film. But if you decide to do a film in the future there are some things that you have to be aware of. A filmmaker should know that there is an ever-growing, very fine library of movies already made dealing with the subject; very fine films by very fine filmmakers. (I won't ever mention all the tons of futuristic crap.) By looking at this library, you'll automatically know what areas have been covered and what visual vocabulary has been established. If you have any conscience whatsoever, you will definitely avoid stealing or repeating anything that's been done before.


"One of the challenges of making a futuristic film is to be different. You want to take a different tack. Of all the futuristic films I've seen, none of them embodies the attitude that *Outland* has. None of them have this type of storyline. In fact, some of them don't seem to be as concerned with story as with special effects."

He stops mid-sentence, quickly shifting gears. "I feel that, in the near future, you're going to see more films like this, more films that concentrate on a story. I

have a feeling that we're going to see a whole new generation of movies about the future that will actually concern themselves, first and foremost, with plot. At least, I hope so."

When asked, at this early stage of the game, what the ideal comment on *Outland* would be to tease audiences into seeing the film, he doesn't have to think twice. "Comment?" Hyams says quizzically. "You mean comments! I would love to see the word filter through the science fiction community that this is a special movie. I'd like people to catch a buzz on this. 'Hey, this is the one.' That sort of honest, buzz reaction is a lot more important to me than all of the money you can spend on advertising. You can't lie to people who go to see movies. They know when a movie is good and when a movie isn't.

"I don't know what causes that buzz. *Star Wars* had it before it opened. *ALIEN* had it, too. I don't know what causes it, I just hope that *Outland* gets that sort of reaction."

Hyams returns to the editing room duties and, together with members of the *Outland* team, begins bringing the story of Con-Am mine operation #27 into focus on the editing machine. "I think it's going to happen," Hyams says. "I think we'll get that buzz." 

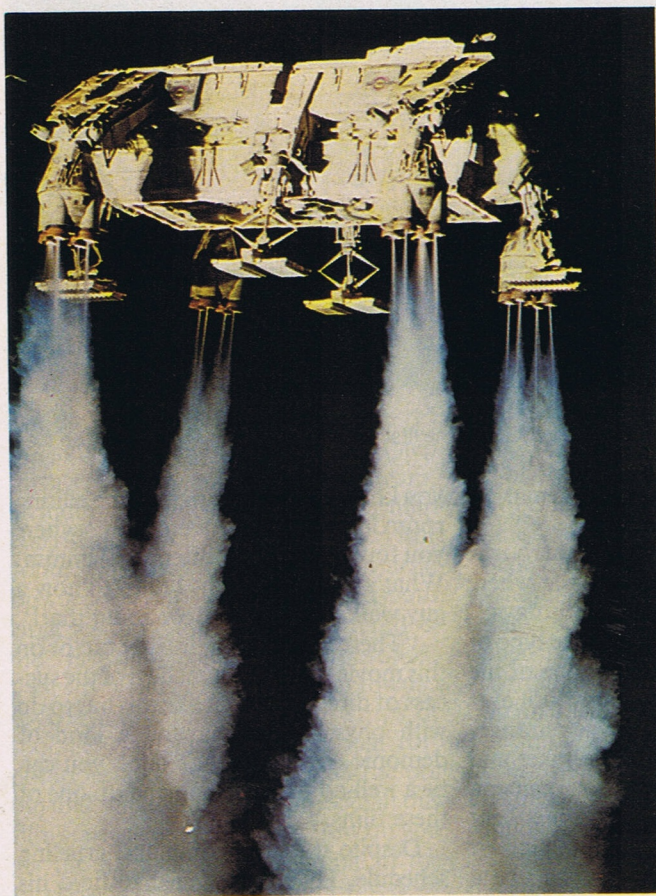
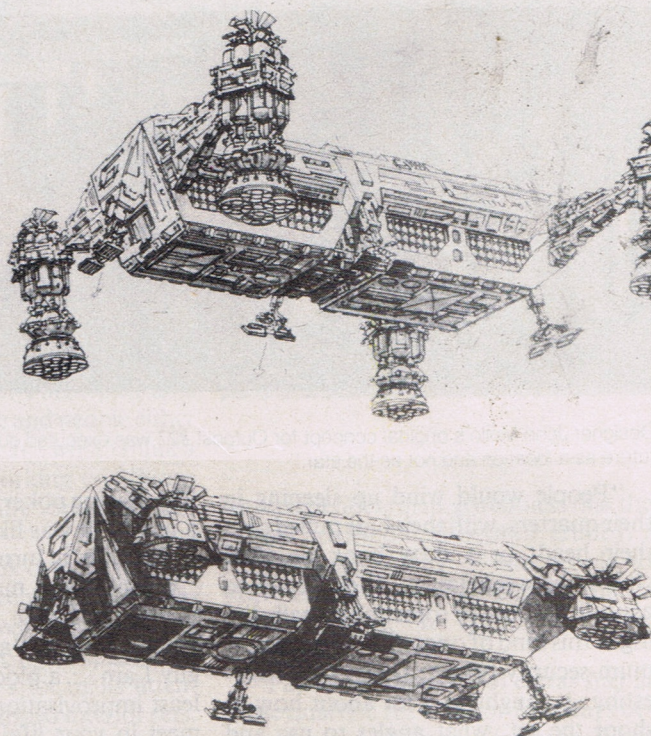


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Left: Shuttlecraft descends on mining colony. Above: Two early concepts for the shuttle; the final version had modifications. The models were built by Martin Bower and Bill Pearson.



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# Ellison

(continued from page 35)

it's a long and arduous process, this what-to-do business. Every time we cut off the censors at the pass, some bunch of self-appointed guardians of morality like Jerry Falwell and his Moral Majority rise out of the slime-pits to burn books. Every time someone beats an institutionalized criminal like, say, a movie studio or a TV network for plagiarism in a court of law, a dozen other thugs steal a little more craftily. Eternal vigilance, kiddo. You have to be as smart as you can be, as tough as you can be and as pragmatic as you can be. Don't believe everything you read or everything they tell you. Keep asking questions. And when you get angry about something that's going down, in your school, your town, your state or the world at large—DO SOMETHING ABOUT IT. Put yourself on the line! Risk a little! And even if you only do a little bit of good, you'll feel like a bloody hero, you'll alter the state of the universe a tot and you'll get tougher for the next time. Here's one to start on now: help get gun control passed in the U.S. Senate. No more Lennons being gunned

down senselessly. Don't buy that bullshit about people needing to protect themselves from crooks with guns. Most of the murders every year aren't by crooks or muggers... they're by people getting pissed at people and blowing them away. Or guns in the hands of nut-cases like the one who offed Lennon. Gun control, gun elimination *can* help. In a big way. And I say this as a resident of Los Angeles, which in 1980 became #2 Murder City in America—1,042 slayings.

Jim Dawson of Sterling, Virginia, wants me to do a column on vasectomies, noting my history of having had one. It's on the way, Mr. Dawson. Most of the time, though, I just sit on top of the silent TV set, smiling at the ceiling; otherwise, it hasn't had a deleterious effect on me.

Some of you, like Sharon Norberg of Miami, Florida, wrote me letters that required no answers. Mrs. Norberg wanted to tell me how much she liked the *Star Trek* movie. Others wanted to deliver long panegyrics on topics almost as boring. I have read as much of as many of these letters as I can. (Sometimes I fall asleep.) Before Mrs. Norberg lectures me on how my putting down of dull movies can inhibit tender souls' dreaming of the future, I suggest she do

something concrete about getting the Equal Rights Amendment passed in Florida, a matter that has much more immediacy for dreams of the future than her plonking down \$5 time after time to see the exploitation of what little love remains for *Star Trek* by its fans.

While we're on the moronic subject of the *Star Trek* movie, back in April a Mrs. Lisa Baker of Castle Rock, Colorado, wrote STARLOG columnist Bjo Trimble asking her to rap my knuckles because I had, in her view, made an error in noting when I reviewed the film—Paramount's contribution to the Ennui Enhancement of life in general—that an ornament on a headband worn by Persis Khambatta hung on the left side in one shot, then over the right on a follow-up. This seeming error in my otherwise flawless reportage of the year's dullest movie apparently drove Mrs. Baker, a grown woman, into paroxysms of anger. Bjo wrote her, quite properly, that her STARLOG column was intended for other purposes than villifying Ellison and that it was none of her, Bjo's, business and that if Mrs. Baker was that outraged at my assailing her sacred cows, she ought to write me directly. Since I have not heard from Mrs. Baker directly, but since the matter has come up

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nonetheless via a Xerox copy of her letter, forwarded to me by my editor, Bob Woods, let me just say this:

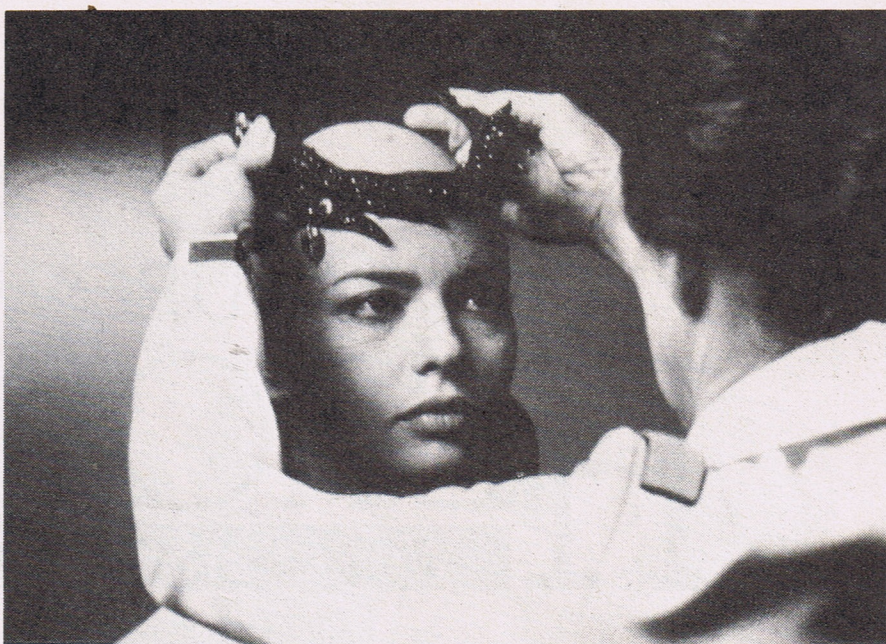
Mrs. Baker is a pathetic case. A grown woman so distanced from reality that her ire is raised enough to prompt the writing of a letter not about how high her taxes are, not about how much she's paying for gas, not about nuns being shot to death by government troops in El Salvador, not about gun control or abortion (pro or con) or Nestlé selling death-dealing baby formula to underprivileged countries...but about a minor point in an undistinguished movie.

I may well be taken to task for pillorying this woman. What harm is she doing by objecting to my alleged error in a critical article, it may be said. Why kill a gnat with a howitzer? Well, I'll tell ya, gang, it's like this: Mrs. Baker is a classic example of what many of *you* have become. And the name for that is zombie.

Mrs. Baker will no doubt reject this. I'll be apprised in short order that Mrs. Baker has led the fight for equal rights in Colorado, that she cooks meals for shut-ins and old folks every day and then drives them over to the recipients free of charge, that she rescued 11 orphans from a burning building, that she discovered a cure for bone-marrow cancer last week, that she is a serious political cartoonist whose work in the *Castle Rock Blat* has brought dozens of crooked politicians to book, that she is beloved of her family and friends, that she has written the definitive social conscience work on the Dreyfus Case, and that in her spare time she does RN work at the local leprosarium. No doubt I'll be told all of this, to prove how shallow and vicious I am in calling Mrs. Baker a zombie.

But until such time, I judge only by the internal evidence of her letter. A letter that is concerned with silliness, a letter that reveals her dander is gotten up not by what goes on in the real world, not even what goes on in the slapdash world of an imbecilic movie, but what goes on in a piece of criticism of that slapdash movie! I submit Mrs. Baker as an object lesson to all of you who justify your obsessions with movies whose sole purpose in this life is to *make money for multinational corporations that own movie studios* by lying to yourselves that these movies bear some relation to life, either as we know it today or as it pertains to the future.

I submit that all of the multi-million-dollar monstrosities you've slavered over in the past five years—from *Star Wars* to *ALIEN*—and I liked *ALIEN* a



Crowning Persis: Worth seeing twice?

lot—that not all of them, taken in total, equal by one one-millionth the humanity contained in *The Elephant Man* or *The Competition*. Not one of them says as much to us as human beings, instills as much hope in us, speaks as clearly to the human condition, as do *Paths of Glory* or *A Child Is Waiting* or *The Deer Hunter*.


Even to discuss empty and empty-headed persiflage like the *Star Trek* movie in the same breath with *Oh, God!* or, again, *The Elephant Man* is to elevate transient commercial dreck to the level of serious attention. And for Mrs. Baker to spend even a microsecond of concern on my being right or wrong about such a minor cavil in the first place, even to dignify her concern by suggesting all my critical faculties should be called into question because I didn't perceive—as she suggests—that the second shot of Persis Khambatta was seen *in a mirror*, indicates that Mrs. Baker read the critique and then went back to see the goddamned movie *again*, just to be able to say I was wrong. Now Mrs. Baker may well be correct. That second shot may have been a mirror reflection (though if a viewer sharp enough to see that the ornament was hanging on the opposite side couldn't tell it was a mirror image, that says something about the quality of direction in the film) but I'd have to go see the film a second time to ascertain same. And frankly, if I need a couple of hours sleep I won't pay \$5 to Paramount for the privilege, I'll just reread Mrs. Baker's letter and doze off.

I attack not Mrs. Baker herself, but what she has become. A person whose concerns are trivial in a world where tri-

viality and mediocrity are used to keep us diverted, entertained, oblivious to what Tom Looby has begun to suspect, that we are in trouble, that we are becoming ever more helpless because great forces push and bend us, that we must be alert and awake and aware...and never permit ourselves to forget that sports and trash movies and dope and God-shouting and all the other toys of the Status Quo, whether called entropy or something else, are intended to turn our senses and our anger away from the desire to fight back.

Mrs. Baker attacks the wrong foe. Television is her enemy; the venal corporations that put together a bad movie to take her \$5 from her are the enemy; the designers of products that fall apart on schedule and for which she cannot get replacement parts are the enemy; stupidity and triviality are her enemies. Our taste in films may differ, Mrs. Baker, but when I walk out of the theater, at least I live in the Real World. God or whoever's in charge only knows where *you* live!

There are more letters. Seventeen more as I sit here. But I've spent too much time on Mrs. Baker and a few others. So I'll have to save them for the next roundup, just a mere six months away. I hope this interlude of sweetness and light has buoyed up your spirits. Feel free to drop me a postcard. Workouts like this merely get me in shape for the serious work to be done.

And have an angry New Year. 

EDITOR'S NOTE: Mr. Ellison has been given a free hand to express his opinions. If you don't like what he says, it's not our fault. If you really love his column, we'll take full responsibility. Publishing is funny like that. The content is copyrighted © 1981 by The Kilimanjaro Corporation.



# From Housewife to HEROINE

## Women in SF Media

By BARBARA KRASNOFF

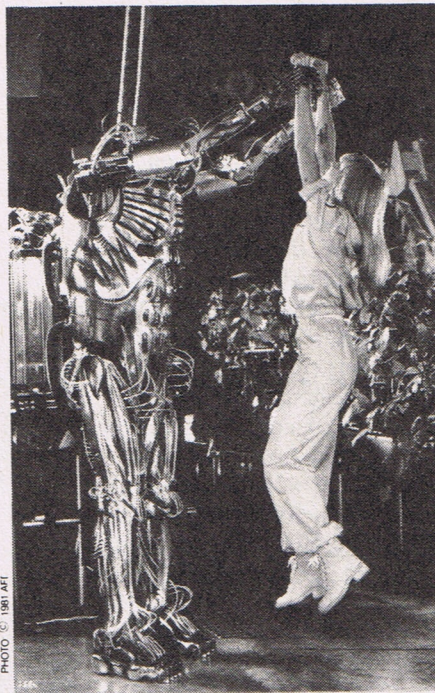
Once upon a time—in a simpler age when movies were in black and white, and you didn't need a loan to buy a bag of popcorn—it wasn't tremendously hard to cast leading ladies for the typical science fiction film. An aspiring SF actress needed only two essential qualifications: a Playboy figure and a good set of vocal cords (the better to scream with, my dear!). Acting ability was, by and large, superfluous—give the lady a pair of glasses and she was a scientist; put her into a white smock and she was her father's lab assistant; squeeze her into a tight dress and she was the hero's girlfriend.... It didn't make much difference in the end.

Of course, all that has changed. No longer are women in science fiction films considered extraneous ornaments that stand around in torn dresses while their menfolk save the universe; no longer are they screaming their lungs out while the drooling monster drags them away for a little interspecies communication. They have brains, functions, a place in the science fiction future—or so we are told.

This may be true—or it may simply be that new categories have been created to give the appearance of change while helping the lady keep her place. Such as the following:

### The Barbie Doll Syndrome

A recent short story by the talented science fiction writer John Varley describes a religious cult in which the members use advanced methods of plastic surgery to make themselves look like Barbie dolls. Actually, Varley is not the



Alex from *Saturn 3*

first to come up with the idea. Television executives have been doing it for years.

In many of today's television series, the human species seems to have developed rather differently than Mother Nature intended. Men, on the one hand, come in many shapes and sizes: young, old, fat, thin, handsome, ugly.... Women, on the other hand, with few exceptions come from one mold: young, chirpy, long-haired and anorexic.

For an excellent example of this type of genetic determinism, one can look at that smorgasboard of special effects, *Battlestar: Galactica*. Apparently, the producers of this show were so excited

by the prospect of a ship full of Barbie Dolls that they decided to do away with acting. After all, what did it matter, as long as the audience had something to look at?

This tendency was especially visible in a two-part episode entitled "Lost Planet of Gods," in which an all-male contingent of fighter pilots is grounded by a mysterious ailment. A group of women, most of whom have apparently done nothing up until then but simpler, are instantly drafted for battle duty—thus opening the way for a locker-room scene in which 20 or so bathing beauties dressed in black bikinis are lectured at by a leering pilot. (Incidentally, that was the last time any of these ladies were seen in the driver's seat. A female pilot was finally introduced in midseason, by which time the battlestar had already sunk in the ratings war.)

A classic entry in the Barbie Doll category is the 1980 film *Saturn 3*, a return to the joys of the grade-B monster movie. It stars Farah Fawcett, the refugee from *Charlie's Angels*, as a childish young woman who lives on a moon mining colony with scientist Kirk Douglas. Kirk takes care of the mining facilities. Farah takes care of Kirk. Everybody is happy.

Into this little Garden of Eden comes Harvey Keitel, a troubled technician accompanied by a large, headless robot. Harvey takes one look at Farah and decides she is the girl for him. The robot does likewise. Harvey and the robot chase after poor Farah, who has a grand time running and screaming at every available opportunity. (But she's so *cute* at it!)







## Evil Exotics

The truly evil villainess—a movie type which is gone but not forgotten. In the early days of SF films, women often came in two flavors: the good, fully dressed, rather insipid heroine and the tall, sexy, but thoroughly corrupt temptress. These latter ladies knew what they



Kala from *Flash Gordon*

wanted, and did their damndest to get it. Of course, they always failed in the end (after all, good must triumph), but it was a lot of fun watching them try.

Unfortunately, these wonderfully evil *femme fatales* have given way, for the most part, to rather pedestrian women who have an unfortunate tendency to fall in love with the hero at the crucial moment. (Many of the old-timers may have tried to *seduce* the good guys, but anyone over the age of 12 knows the difference *there*.) Most of the female bad-dies in the TV series *Star Trek*, for example, would be mooning helplessly after Captain Kirk by the second commercial break. Kirk, who had a Freudian thing going with his starship, would use their affection to win the day. No softie he!

However, the latest remake of the old SF serial *Flash Gordon* has revived the tradition in a manner well worth noting. It features two of the baddest ladies seen in a long time: Princess Aura, the Emperor Ming's lustful daughter; and Kala, a sleeky android who is in charge of a network of circuited spies. While the princess throws amorous glances at every male in sight, Kala struts around the set plotting the downfall of our heroes and threatening anyone who gets in her way with an intensity of malevolence that is truly inspiring. One suspects that, given the choice, Darth Vader would be a much more comfortable companion.

Unfortunately, there are not many examples of true female villainy around in these degenerate times. *Superman II*, the sequel to the 1978 *Superman—The Movie*, will feature a female Kryptonian criminal who was, in the beginning of the first movie, trapped in the mysterious Phantom Zone, and who has now been released to wreak havoc on Metropolis. One hopes that she will prove worthy of her calling.

## Close But No Cigar

When *Star Trek* went on the air in 1966, many viewers were quite impressed with the presence of woman crewmembers on board the starship *U.S.S. Enterprise*. Here was a true glimpse into the future, when everyone would have the chance to fulfill themselves as creative members of society. A true breakthrough in media's depiction of women. Congratulations all around—right?

Well...

In the show's first pilot film, "The Cage," the starship's second-in-command, Number 1, was portrayed as being unemotional, intelligent, efficient, capable of taking command... and a woman. This was, of course, a mistake. According to the local moguls, television audiences would never accept such an unfeminine personality. Good women didn't act like that. And anyway, what crew worth its salt would take orders from a lady? The character was dropped.

By the time the series made it to the TV screen, the women were in miniskirts and safely ensconced in various acceptable positions. The highest ranking female officer was Lt. Uhura, the communications officer, who for the most part sat at her high-technology telephone switchboard opening channels and clos-

ing channels and opening channels... Nurse Chapel's main role seemed to be to pant after the alien Mr. Spock; and Yeoman Rand, a nice blonde girl who was dropped after the first year, spent most of her time wearing tight uniforms and serving coffee.

In another attempt to portray some kind of equalized society, the female guest stars were, for the most part, assigned a variety of professions: doctor, lawyer, actress... However, by the end of the third season, TV tradition had triumphed. *Star Trek's* final aired episode was an embarrassing little number entitled "Turnabout Intruder," in which a woman, made insane by the frustration of being denied a ship's command because of what she perceives as sex discrimination, forcibly exchanges bodies with Captain Kirk. It soon becomes obvious that a feminine psyche can't handle the stresses of command: the "female" Captain Kirk cannot make decisions, throws temper tantrums, bursts into tears at the drop of a hat—a "typical" woman. At the end of the episode, the woman is restored to her body and the two male leads muse righteously on how much happier she would have been if she had only known her place.

In the 1980 film version of the series, *Star Trek—The Motion Picture*, everybody was promoted, but their roles remained the same. Uhura still opened channels, "Dr." Chapel stared longingly at Spock, and a bald alien named Ilia took her place on the bridge. According to the script, Ilia comes from a planet where sex is used for a lot more than reproduction—a fact not explained in the final edition of the film, thus causing a lot of audience confusion when she explains calmly that she has taken a vow of chastity.

Unfortunately, Ilia the navigator doesn't get much chance to navigate. About midway through the film she is turned into a robot by V'ger, a curious interstellar computer looking for its mother. To indicate this change of species, Ilia spends the rest of her time tapping around the ship in a white minidress and a pair of plastic high heels—standard space wear.

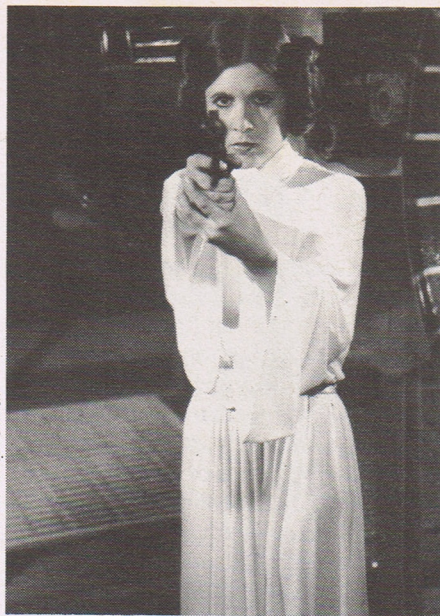
## Spunky Sisters

By the time moviedom entered the 1980s, most film producers had come to the belated conclusion that audiences were becoming impatient with the usual screaming and/or helpless heroines. However, it was still hard for them to conceive of a woman who could be truly heroic. She had to be brave... but cute. Spunky.



Ilia from *Star Trek—The Motion Picture*





Princess Leia from *Star Wars*

Princess Leia Organa from *Star Wars* and *The Empire Strikes Back* is the epitome of spunk. Placed in the rather traditional role of damsel in distress, she immediately disconcerts her erstwhile heroes by taking charge of her own rescue. She stands up to the evil Darth Vader with considerable aplomb, wields a mean laser pistol, and even, in *Empire*, gets to pilot a starship after its owner is hijacked. All in all, a pretty neat lady.

Much of her courage probably stems from the fact that she had to learn to get along in a universe that is apparently bereft of women. When producer George Lucas first conceived of *Star Wars*, he took much of his scenario out of childhood dreams of space adventure—and, as in most pre-adolescent boyhood fantasies, girls are an intrusion. Except for the hero's aunt, a put-upon farmer's wife who is conveniently annihilated in the first 15 minutes of the film, there are no women to be seen. The bad guys are all men. The good guys are all men. Even the aliens, one suspects, are all their particular equivalent of male. One wonders if poor Leia had anyone to play with when she was small.

Another very spunky heroine is Lois Lane, girl reporter—who, in *Superman—The Movie*, asks the first alien to appear on Earth coy questions about his sex life, and who can't seem to follow up on a story without constantly needing to be rescued. Sure, she's brave—but can't she do *anything* right?

## Heroines

There is a large, vicious, highly dangerous alien stalking the human crew of a lonely starship. One by one, the unfortunate victims are destroyed by the creature, until only one is left. In a tense con-

frontation in the confines of a small escape pod, the remaining crewmember manages to don a spacesuit and blow the ship's hatch, sending the alien to its doom in the vacuum of space. A rather pedestrian plot for an SF film—unless you know that the inventive survivor is a woman.

Admittedly not much more than an updated monster movie, *Alien* is, nevertheless, one of the best film portrayals of human beings in a tense situation in recent years. The crew of the ship *Nostromo* is a varied group, each with individual weaknesses, foibles and strengths. They are ambitious, brave, greedy, cowardly, foolish in some ways and clever in others. Some are more good-looking than others, but none glitter with the kind of plastic beauty (male or female) that SF films are so rife with. Even the crewmember who turns out to be a robot seems a lot more human than many other SF characters today.

Ripley, the lone survivor mentioned above, is a wonderful example of a truly heroic character. Sure, she's scared of

take his word for it—she waits until events substantiate his story. And when he is almost lost as a result of these experiments, she (literally) wades in to save him—heroically.

Actually, there is a gratifying increase these days in the portrayal of real, brave, believable women in science fiction films—and they can appear in some of the most unlikely places. In the TV space opera *Buck Rogers*, Wilma Deering, who in the film played a typical Barbie Doll clone, was transformed into a qualified, take-charge pilot who frequently has to come to Buck's rescue. *Time After Time*, a pleasant, romantic film in which writer H.G. Wells chases Jack the Ripper forward in time, costars Mary Steenburgen as a young bank officer who shows a bewildered Wells the wonders of 20th-century San Francisco. And *The Incredible Hulk*, a television show which offers the "believable" spectacle of a man turning into a big green monster, also features some of the most surprisingly realistic portrayals of women on television today.



Emily from *Altered States*

the alien—who in their right mind wouldn't be? But during the high point of the film, when she discovers the creature only a few feet away, she doesn't go into the traditional freeze-and-scream—she gets *rid* of the sucker!

Another recent SF movie, *Altered States*, concerns the efforts of a superintelligent, if slightly neurotic, scientist to discover the purpose of life through the use of hallucinogens and an isolation tank. His wife, Emily, is a scientist in her own right—an anthropologist—and when her husband runs off to pursue his weird quest, she doesn't wait at home pining for his love—she picks up the kids and goes off to Africa to follow her own studies. When the man returns jabbering of strange metamorphoses, she doesn't

In the world of science fiction films, women have always been considered somewhat alien—more so, sometimes, than the bug-eyed monster from another planet. This is not really much of a shock, considering that early pulp science fiction, which was directed strictly toward a young, male audience, took much the same stance; and it has been conjectured that SF celluloid runs about ten years behind SF literature in terms of sophistication and attention to current trends.

However, all that is changing. Hopefully, the film industry has finally discovered that, when it is time to boldly go where no man has gone before, quite a few women may decide to come along for the ride.



## Future Music: Setting the Tone

Sound is input. As far as the human brain is concerned, sound is merely one of a half-dozen or so information conduits feeding it data from the outside world. But beyond this strictly functional purpose, sound also serves as a very elementary way of altering our consciousness. Much like light, sound is perceived both physically, as a direct assault on the body and its sensory apparatus, and psychologically, as an inner-voiced relationship of tone, texture and rhythm. When these psychotropic and informational quantities are controlled and influenced by human design, sound becomes music.

Music has been with us for quite some time—something I'm sure doesn't need pointing out. Let's say it's been around since the first Neanderthal grunted tunefully to himself as he splashed around the river near his cave. The process of refinement, progress, started when his wife joined him, using a couple of clothes-washing rocks to bang out a nifty tempo at the river's edge. Jump-cut several thousand years forward, and while there's still singing in the shower going on, the continued process of refinement has altered the face of music beyond the comprehension of our friendly, humming hulk. The trend that started with early man pounding on some hollow logs with a handy stick or two, or exhaling forcefully into a conch shell, has led us to the development of the synthesizer. The music made today with a synthy might sound a bit different from what preceded it, but it's still music, and it still fulfills the basic need of humans to alter or expand their consciousness.

A short digression here on the importance of change seems in order. I would hope, though, that little has to be said about this to the readers of this magazine, and I can freely assume that the futurist vision championed in these pages embraces the inevitability of change and the capability of the human spirit to guide it in a sensible direction. As the world changes, so must the art that reflects and interprets it. While the beauty of a Bach Cantata or a Wagner Opera doesn't diminish with age, its relevance to our condition of the moment does. As each new generation of artists seeks the precise vocabulary to embody

their ideas, they must inevitably diverge from their predecessors because *their* world is a new and different one, needful of new modes of expression. The world doesn't remain the same—life just ain't like that. (Brian Aldiss' *The Malacia Tapestry* is the Q.E.D. on that subject.) That things move with such incredible speed in our era can rightly be considered a blessing (despite its attendant disorientation), because from it we can learn the healthy perspective on change and to keep our sights on what lies ahead. It should come as no surprise that science fiction of the futuristic variety is a creation of the modern age, where for

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The trend that started with early man pounding on some hollow logs with a handy stick, or exhaling forcefully into a conch shell, has led us to the development of the synthesizer.

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the first time in human history the impossibly distant future is knowable in one's own lifetime.

Music, like visionary fiction, has also been oriented toward the future by the tempo of change since the Industrial Revolution. Through technology, and the cultural ferment induced by technology-influenced societal change, music in this century has undergone more drastic change than it has seen throughout its entire history. Needless to say, it's still going on. Just 75 years ago an American inventor named Thaddeus Cahill unveiled what he called a "Dynamophone" or "Telharmonium," which would transmit pure, electronically-generated tones over the phone wires to subscribers—the first synthesizer. Five years later, Italian composer Ferruccio Busoni

would exclaim (in his influential essay, "Sketch of a New Esthetic of Music"), "What a vista of fair hopes and dream-like fancies is thus opened!" In a remarkable bit of prescience, Busoni tagged Cahill's device as the instrument that would free music from what he saw as the repressive bonds of an outmoded set of ideas. It was not simply technophilia that led Busoni to advance this thought, but the notion that this instrument had command of an almost-infinitely divisible spectrum of pitch. No more were musicians restricted to the 12 unchangeable tones per octave of the rigid Western scale. It was the spaces between those 12 notes that fascinated Busoni, and in a leap of intuitive futurism he grasped the emerging formative influence of technology on the esthetic face of art.

In Busoni's wake came a multitude of others, like Igor Stravinsky, whose riotous "Rites of Spring" caused a violent uproar at its 1913 Paris premiere; Edgard Varese, who was the first to call his music "organized sound" and the first to utilize sirens and primitive synthesizers (Theremins); the mischievous John Cage, whose more notorious compositions include a four-and-a-half-minute piece for piano consisting of complete silence, and one for 12 radios manipulated by the fingers of 24 dial-turners; and the electronic pioneers, like Otto Luening, Vladimir Ussachevsky, Karlheinz Stockhausen and Walter/Wendy Carlos.

The effect of electricity on 20th-century music has been incalculable, involving itself deeply in all stages of creation: conception, performance, recording and playback. The advent of electrical recording in the '20s, magnetic tape in the '40s and stereo in the '50s changed attitudes through free access to music, and caused a great demystification and democratization. Traditional instruments were amplified (Charlie Christian of the Benny Goodman band was the first to play an electric guitar in 1936), or electro-mechanical ones developed (the Hammond organ, another step toward the synthesizer, was invented in 1935), while later completely synthetic ones emerged (the room-sized RCA Mark II synthesizer was installed at the Columbia-Princeton Electronic





Synthesist Michael Hoenig is an example of part of tomorrow's music scene.

Music Center in 1959, and the first portable prototype—the Moog—was built in 1964). All of this has yet to be fully absorbed into the fabric of modern music.

The second key word for this column (note it right after “change” in your lexicons) is plurality. As much as I yammer on about synthesizers, or unilaterally declare rock to be the most relevant, vital modern music (I haven’t yet, but I will), I am not dumb enough to believe that those two words account for all that is worthwhile on the scene. I’m not *that* foolish. It’s clear to anyone paying attention that in music today anything is acceptable. Excepting complacency. There’s a great restlessness in the air and a distinct shortage of the type of narrow-

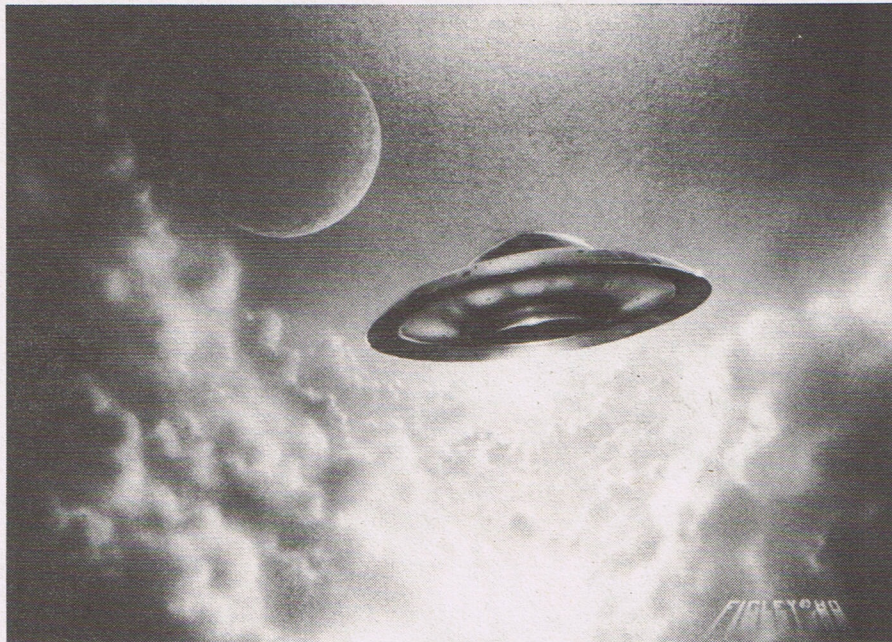
mindedness, intolerance of musical deviance, and odious toss-out-the-old-farts-and-kiss-the-toes-of-the-young-turks attitude usually so prevalent in art movements. There’s just too much going on for anyone to close their ears to any of it, and still retain any real perspective on the true state of modern music. It’s all there: dance music, industrial noise, reggae, Balinese gamelans, Greek bouzouki, rock, rockabilly, traditional orchestral music, African drumming, jazz, minimalist trance music, Eskimo music-drama, salsa, disco, space music, verbal tape collage, found object music (*musique concrete*) and synthesizer techno-rock.

It will be the intention of this column

to cover as much music of futuristic vision as possible, given the writer’s prejudices and areas of interest. Fusions of disparate styles and/or ideas are especially sought out, and you can look forward to continued concentration on maverick visionaries in these pages (past examples: Jon Hassell, Don Van Vliet, The Residents, Pat Gleeson, Devo). New recordings from around the globe will be reviewed, new technology from performance to playback discussed, books of interest noted and new ideas dissected. It should be fun. See you next issue with a report on and interviews with members of Ultravox and the Yellow Magic Orchestra—the techno-rock vanguard. 

PHOTO: WARNER/REPRISE





Space art just for the fun of it.

## Dale M. Figley

By BARBARA KRASNOFF

**M**y family is basically made up of science fiction nuts," space artist Dale M. Figley grins. "My mom and dad used to tell us they were from different planets.

"My first recollections of a movie is of a science fiction movie. That's all I've ever liked. That's all I ever read."

With this type of strong enthusiasm for speculative fiction, it is hardly surprising that the young painter uses his art to express his dreams of space travel. Born in Portland, Oregon, in 1950, Figley moved to Vancouver, Washington, after a stint in the Air Force, and went through several jobs before finding his vocation. "I've been pretty much a laborer," he explains, "going from job to job. I never found anything I liked until I started painting.

"My dad was an artist before he started working—he's a technician now—and I got some background from that. My brother Craig, who does airbrush work also, is an artist; he's been doing it for quite a few years. My teachers probably remember me drawing spaceships on my study papers... but that's about all I'd ever done.

"About 1977, my brother bought me a book of Roger Dean's stuff, *Views*, for a Christmas present. I sat and looked at that for about six months, and one day it dawned on me how it was done! I just started trying to do it myself, and I've been going at it ever since."

Dean's work has had a great influence on Figley, who is largely self-taught (he has taken an airbrush course and some art courses at Clark College in Vancouver, and intends to continue his studies).

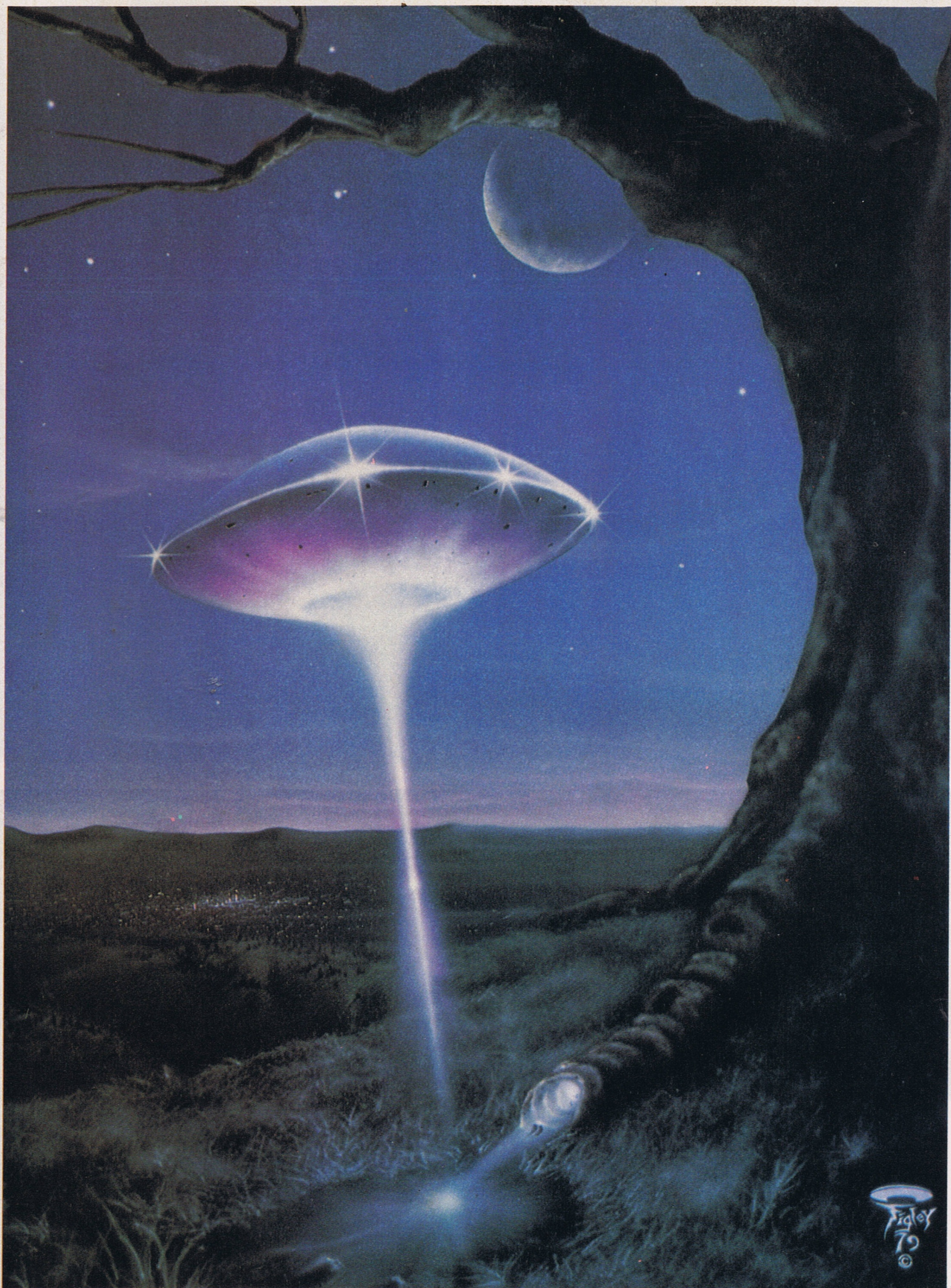
For example, both "Migration" and "Seeds," on page 60, were reactions to Dean's style. "He does floating-type rocks and stuff in space," Figley says, "and those were my interpretations of the theme.

"The title 'Migration' was suggested by my brother. I love to do rocks, it's one of the first things I figured out how to do, and I love making shapes of rocks in space. This one is a volcano upside down. It's flying away from you in space." He smiles. "I imagine technically it's not exactly correct, but the idea is sort of the fun of it."

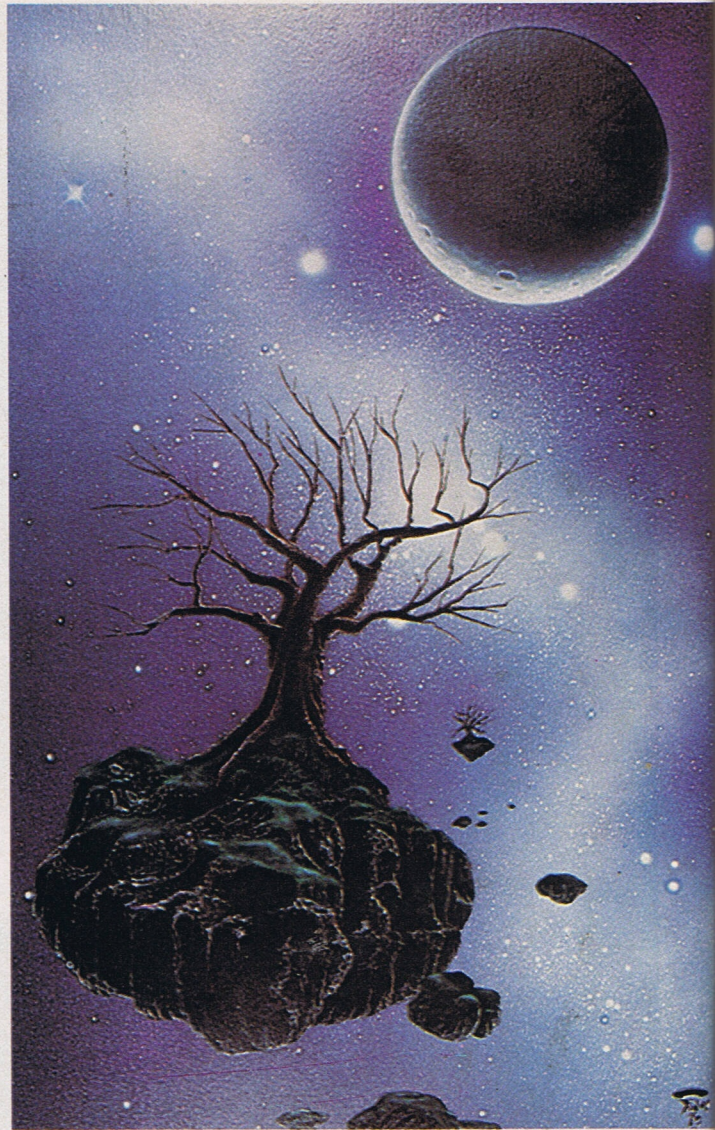
The painting "Hole in Space" on page 61 was done as an experiment in different media. "I built a water trough with a plastic liner and filled it with warm water," Figley explains. "I sprayed a bunch of paints in this trough,

In "UFO #25" a spaceship lands on an alien planet. Notice the two tiny people at the tree's root.





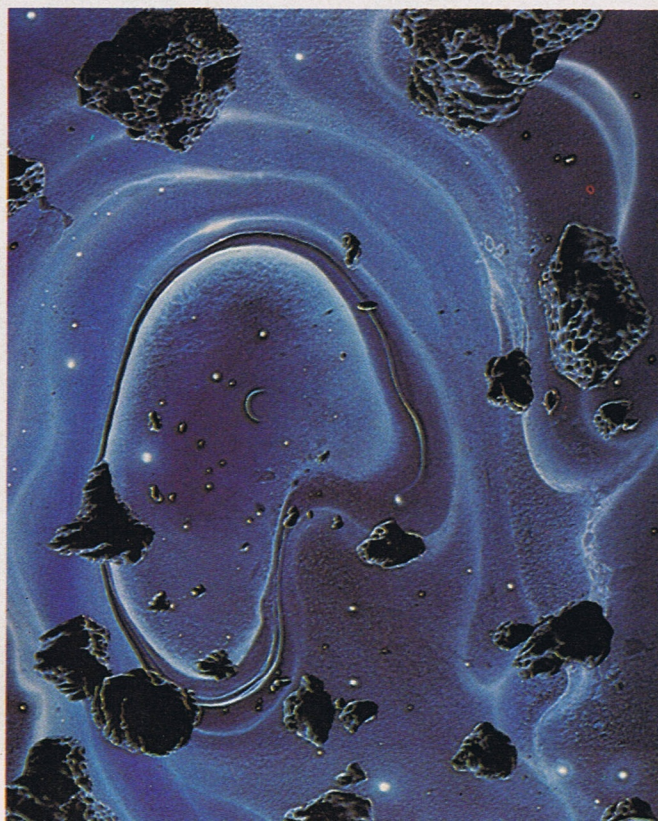








Clockwise from far left, above: Both "Migration" and "Seeds" were inspired by Roger Dean's art. "Mystic Travelers" portrays a multidimensional life form floating through the outer reaches of space. "Hole In Space" was produced by observing the pattern made when enamels were sprayed in a trough full of water. "UFO #13" was painted when the artist "wanted to mess around with that shape" "Spaceship #16" won fifth place in the master's division at the West Coast Comic Book Club Art Show.



ART © 1981 DALE W. FIGLEY





ART © 1981 DALE M. FOLEY  
Foley  
79



"I don't have a lot to say about my stuff.  
I didn't have any real serious designs  
on painting. It's been just for fun."

and then I took the board, plunked it down in the water and built a background up from that. It looked like a black hole.

"I did experiments with that way back in 1968 when I was in college, just messing around with some spray cans. Roger Dean does some work like that he calls marbling. That was one of the paintings I did when I was really into looking at Roger Dean's work. He was successful with water and enamel in what he'd done, so I tried it my way. It has its limited uses—but it was interesting."

"Mystic Travelers," the painting on page 61 which features an alien life form floating in the vacuum of space, was also something of an experiment, this time with perspective: "That's the second or third painting that I actually sat down and painted with an airbrush," Dale says. "The idea was that it wasn't supposed to be to scale. That was up to the imagination. It was supposed to be multi-dimensional—any size." This particular experiment won first place in a local art show.

Unfortunately, as many artists know from experience, art is not always a particularly profitable calling. "There's not much money in doing artwork for people in shows and stuff like that," Figley admits, and laughs. "If I did oceans, I'd make a lot of money." Therefore, in order to supplement his income, he uses his talents to decorate motorcycles and vans.

"I started painting with the airbrush in 1977," he says, "using water colors and acrylics originally. I wasn't having any success with it. I do a lot of model painting—I used to build model rockets as a hobby, I was into that really heavily—and I just happened to have a couple of cans of model paint. I grabbed one of them one day and started thinning it and using it to paint with. It worked so well! Then I realized it was more or less the same type of paint you use on a car, and it applied really well, and so I just started doing it.


"My wife works, and I don't get a lot of work. My main money is from doing vans and motorcycles and that type of work, and with the economy the way it is, it's been pretty slow. But we've been keeping alive pretty well."

One way to make art pay is to sell prints of your work. Figley is attempting to do just that with his tribute to the SF film *Earth vs. the Flying Saucers*. "Someone suggested to me that I ought to try a piece in black and white," he recalls. "It costs \$3,000-\$4,000 to have a color piece done into 1,500 limited-edition prints, and I didn't have the money. I had never worked in black and white, so I sat down one day and started messing around—and that just came out." He pauses for a moment. "That happens to a lot of my work. I don't usually plan. I have a basic idea in my head, and I more or less let the paint suggest what I'm going to do. I'll start working and it just kind of builds up out of it." Signed and numbered copies of Dale's print, which appears on page 58, are priced at \$5.00 apiece, and can be obtained by writing Dale Figley at: 804 East 26 St., Vancouver, WA 98663.

Figley's plans for the future are rather vague. He and his brother, who also does a great deal of airbrushed science fiction art, are planning to collaborate on a book project; and Dale is also working on an amateur science fiction film with some friends.

"I don't have a lot to say about my stuff," he admits modestly. "I paint for fun. I didn't have any real serious designs on painting. It's been just for fun."

"One day I did a painting with the airbrush and somebody bought it. It's all been kind of scary—selling works and stuff like that. But I guess one thing I'd like to tell people about is I just do it for fun. I don't paint any special meaning into my artwork. It's just nice to look at."

"I like science fiction art. It teases the imagination." Hopefully, Dale Figley's fine art will continue to tease our imaginations for a long time to come. 

"Spaceship #18" was painted as a trade-in for an auto decorating job.



# ROBOTS INVADe PITTSBURGH

At Carnegie-Mellon University, a new institute will bring American robots up-to-date.

By ABBY GELLES

A robot with human-type hands and legs, TV-camera eyes and artificial ears and mouth, exhibits the capabilities of a human toddler—it locates, then walks to fetch items requested by its Japanese instructor; speaking its confusion when commands are not clear. Science fiction? No—science reality. Thomas J. Murrin, president of Westinghouse Electric Corporation's Public System Company, and one of those dedicating Carnegie-Mellon University's new Robotics Institute, saw the mechanism on a recent tour of Far Eastern factories and laboratories.

In his December 9, 1980 address, Mr. Murrin continued, "We visited the factory of a leading robot manufacturer in Japan. We saw about 25 robots making parts for more robots. At night, the lights are shut off while—unattended—the robots and machine tools busily continue making parts for more robots."

Japanese robotic industrial research and development, through increasingly sophisticated automation, continues to improve upon the manufacturing productivity and quality which have tipped the world's balance of trade in favor of

this tiny country. Industrial leader Murrin asserts the insights gained by his robotics survey team "indicate that the Japanese are not content with their current capabilities. Instead, they plan to keep forging ahead. For American industry—and our American economy—the implications are awesome.

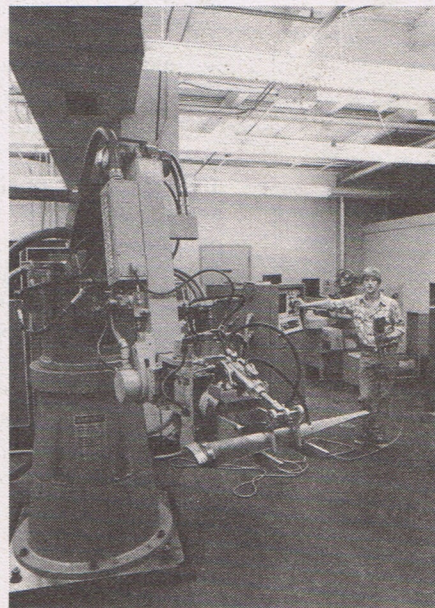
"One basic conclusion from this trip is that we cannot be satisfied with small, incremental improvements in our industrial technology. Instead, we need to leapfrog beyond the current competitive state-of-the-art."

The Carnegie-Mellon Robotics Institute in Pittsburgh, Penn., represents America's new thoroughbred entry in the race to readjust that balance, and its attendant improved quality of life for our citizens. Westinghouse has contributed one million dollars toward the Institute's first year budget as part of that firm's major commitment to productivity and quality improvements. "Through the Carnegie-Mellon Robotics Institute," Murrin explained, "we are looking to a merger between the industrial and academic sectors which will result in highly innovative, yet practical,

advances in industrial technology."

In his dedication address, Institute Director Dr. Raj Reddy, Professor of Computer Science and specialist in artificial intelligence, man-machine communication and sensor systems, answered the question, "What is new about our research?" this way: "The first generation robots that we read about in the media are incapable of dealing with dynamically changing and unpredictable environments. They are mostly blind and deaf. . . We are working towards second-generation robots which sense, think and manipulate the world around them."

Two floors below the speakers, in the Sensor Lab, young researcher David Bourne talks into another microphone, to an audience of one. "Drop," he says to the listener, and an Autoplace mechanical arm drops downward, positioning itself in line with an object poised on a stand. "Reach." The arm moves forward toward the object. "Grasp." Obediently, the claws attached at the arm's end open and close firmly around the object. With the aid of an inexpensive microcomputer of the type popularly designated for "personal" use, in



Robots are now capable of assembling delicate parts (left), finding objects by sight (center) and transporting material (right).

PHOTOS: JEROME MCCAVITT, CARNEGIE-MELLON UNIVERSITY



conjunction with very first speech recognition unit (delivered only 12 hours earlier), robot master Bourne has miraculously endowed one of the first-generation robots described by Dr. Reddy with the ability to hear.

In practical terms, the experiment's importance lies with the removal of human workers from dangerous proximity to the arm's grasping end during "training" to a place far distant where the worker speaks in familiar English words to his mechanical assistant.

David Bourne belongs to a team of Institute staff assigned to assist Westinghouse in building the Factory of the Future. Westinghouse and other industries will implement on their premises the advances developed at the new Carnegie-Mellon Robotics Institute to produce real goods, of better quality, with a fraction of the time or labor costs expended using today's methodology.

If Bourne's robot hears, several of those next door in the Vision Lab see. Advanced beyond primitive sighted machines, these distinguish gray shades and three-dimensionality, imparting the ability to distinguish between similarly endowed objects and eliminating the costly human set-up still required to sort parts for automated production lines. More importantly, mobile robots attain the ability to pick out objects of interest as they amble through crowded natural environments.

Some of the problem of parts distinction is also solved with action. In a corner of the Vision Lab, an apparent game of "pick up sticks" between a man and a table-top robotic arm draws the visitor's attention. Actually hard at work, Dr. Jerry Agin's robot is segregating piles of bolts into groups by size, fitting each upright in a slot devoted to its group. Agin proudly teases his robot, dropping a closely packed pile of bolts underneath its camera "eye" in such a way that portions of the shape of each is hidden underneath another. The robot nudges the parts apart, until each lies adequately spaced from the others to allow individual identification.

Upstairs, Dr. Reddy's dedication speech continues. "We are also initiating research towards third-generation robots which are autonomous, capable of planning, movement, navigation and performing a specified mission without any human intervention." In the labs, examples of that third generation are already in progress. Dr. Mark Fox, Institute representative from the Graduate School of Industrial Administration, leads a team producing computer software so intelligent that machines take on

the capability to run entire factories, replacing everyone: factory floor workers, bookkeepers, managers. In fact, the machines make decisions far more timely and accurate than those historically attributed to humans, adjusting to unforeseen changes in planned production schedules as sensors distributed throughout the shop floor report current conditions of equipment, inventory flow, etc. In addition to rescheduling production, the system appropriately adjusts accounting journals and assesses replacement retooling options. The computer recognizes information contextually, just as humans do, rather than by the label employed by today's common information processing systems. (The observer wonders who is the student here, for the computer works at expanding its managerial expertise with all the diligence of an MBA candidate. Will the future bring purposeful job competition between cognitive machines?)

Despite the limitations of today's commercially available robots (a subsequent opening-day luncheon conversation reveals that the Japanese export none of their sophisticated robots, so high is the demand within), American companies are lined up to take delivery, according to Eugene Bartel, senior research engineer and assistant director of the Robotics Institute, who attests to a resulting scarcity of robotic and artificial intelligence experts. Both robot manufacturers and users clamor to hire Ph.Ds and master's degree holders in robotics.

Carnegie-Mellon University, as a teaching institute, will prepare these employees, filling the void where no formal degree program formerly existed. Already, a multidisciplinary course of study mixes mechanical and electrical engineering studies with those in robotics. Soon, sufficient staff will gather in a new, separate facility, encompassing 5,000 feet of office space and 10,000 feet of laboratory space, to extend the program to one culminating in formal robotics degrees.

Why Carnegie-Mellon? In the words of university president Richard Cyert, only three places in the country could appropriately house this mixture of robotics research and schoolings: Stanford, MIT and Carnegie-Mellon. The latter, according to President Cyert, has already received indications that some faculty from each of the other two would like to take part in Carnegie-Mellon's project. College of Science dean Daniel Berg relates that, of the three, Carnegie-Mellon excels in computer science, though the others enjoy a

more well-rounded reputation.

All three institutions have hosted experimentation in contextual data retrieval, computer vision, speech recognition and mobile self-directing machinery for years now. However, this type of study has remained the plaything of scientists; pure science for the sake of academic discovery, rather than reaching to solve currently known applications problems. The Robotics Institute's projects are sponsored by real clients participating in a publicly announced contribution program which actively seeks investors from the American corporate community. Contributors are invited to send people to the institute and suggest research areas, and will receive all non-proprietary data, computer programs, reports and documents generated from Institute research. Thus, in accordance with the recent joint mandate issued by the National Science Foundation and the Department of Commerce, private corporations will join with a learning institute to foster applied R & D, while sharing results with each other to speed progress toward automated industry.

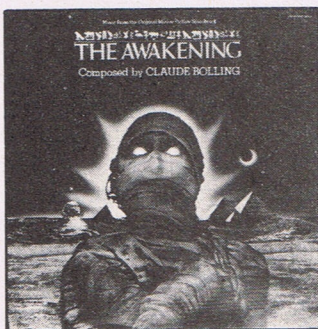
Dr. Reddy proclaims, "The intellectual ingredients needed for this revolution have been around at CMU for some time." He boasts a staff of over 35 professionals, including 16 Ph.Ds, which he believes is the largest single group of scientists and engineers working in robotics at any institution.

In addition to the Factory of the Future, Dr. Reddy describes a broad program of research aimed at improving the quality of life, with investigations into utilization of robots in mines, underwater, in space exploration, for rescue and repair under highly radioactive conditions. Medical applications include micro-surgery and prosthesis.

Some of these objectives regarding robot roles arose under the direction of the Navy, a second large contributor to the \$2.5 million 1981 project budget. Representative Rear Admiral Albert Baciocco Jr., head of the Offices of Naval Research and Naval Technology, described the military's interest for the opening ceremonies audience: "The shortage of military manpower can find relief in many areas by the substitution of intelligent systems for human labor. Robotics will replace people where efficient, unemotional performance in hostile environments is critical to mission success: in space, on land, at sea, or beneath the sea."

Carnegie-Mellon has a big job ahead in maintaining the balance of this country's first facility marrying applied with basic science, today and tomorrow. ▮





## THE AWAKENING

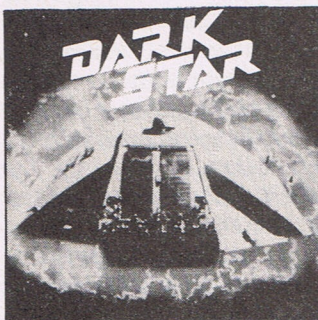
Starring: Charlton Heston, Susannah York and Jill Townsend. French composer Claude Bolling (*Borsalino*, Neil Simon's *California Suite*, *Willie and Phil*, etc.) has created a mysterious exotic score for this modern gothic horror movie, and the original soundtrack music has been beautifully arranged and pressed by Entriacte Records.

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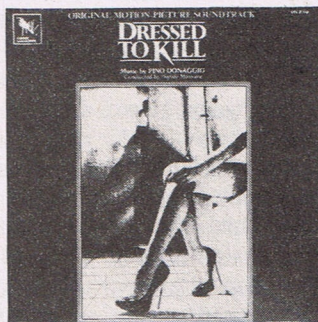
Starring Richard Thomas and a bizarre cast of aliens in a humorous space adventure exploding with visual effects. The soundtrack score (hard to find) is an exciting orchestral kaleidoscope... one of the best SF movie albums in a long time, from Rhino Records.

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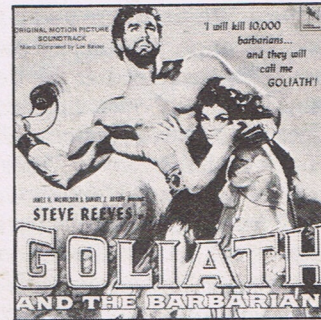
## DRESSED TO KILL

Sensational DePalma thriller. Exciting Herrmann-esque music.



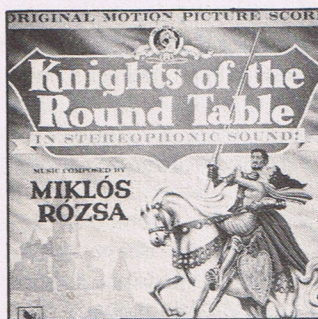
## JOHN PAUL JONES

Composer Max Steiner conducts thrilling adventure score.



## GOLIATH

Exotic score by Les Baxter for Steve Reeves classic.

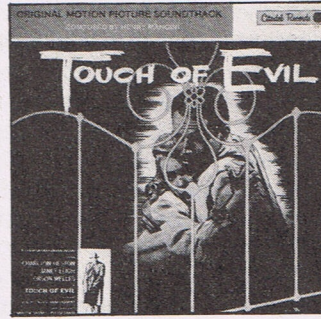


**KNIGHTS OF THE ROUND TABLE**  
Miklos Rozsa stereo rouser to CinemaScope epic.



## SAMSON AND DELILAH

Romantic C.B. DeMille drama, music by Victor Young.



## TOUCH OF EVIL

Joseph Gershenson conducts thriller music by Henry Mancini.



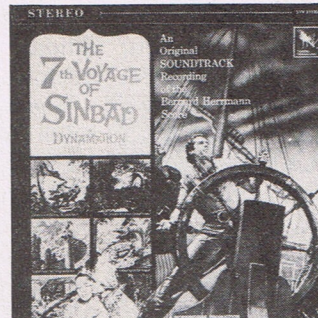
## CAPTAIN HORATIO HORNBLOWER

Robert Farnon conducts his score for adventure/sea epic.



## MAD MAX

Dynamic, percussive music to futuristic adventure film.



## 7th VOYAGE OF SINBAD

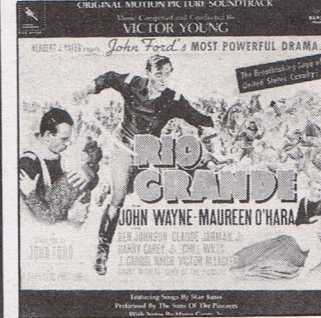
Herrmann conducts original soundtrack. First time in full stereo!



## ROCKETSHIP: XM

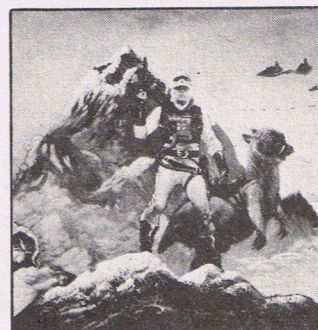
The Classic 1950 SF/adventure movie, with music by Ferde Grofe.

SR-1000



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# SOUNDTRACK SPECTACULAR

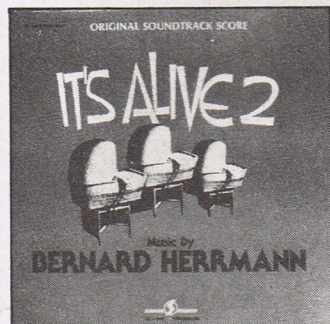
## First Men in the Moon And Other Original Motion Picture Scores

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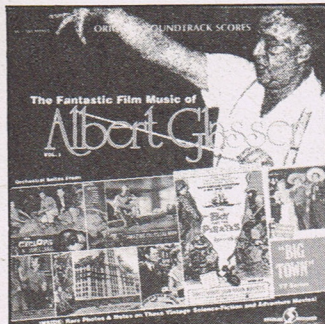
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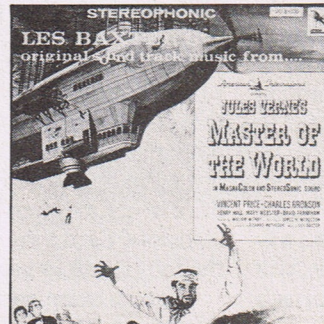
DIGITAL STEREO



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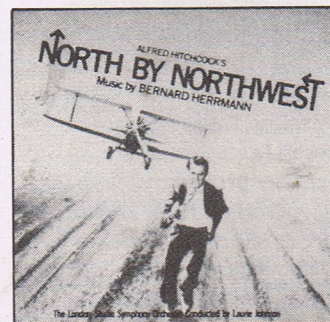
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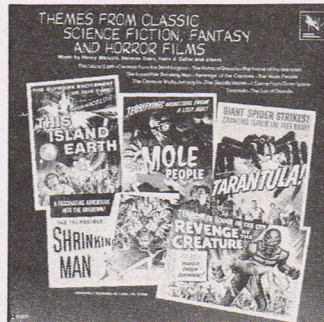
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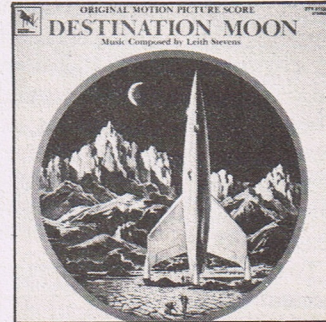
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## The Politics of Ecology: Is Anyone Listening?

In his final days in office, President Jimmy Carter delivered several speeches to Congress in which he summed up the state of the union to be inherited by Ronald Reagan. Repeatedly, Mr. Carter spoke of the environment; and well he should, since this is one area where the former president made some lasting marks. Indeed, as he entered office four years ago, Mr. Carter emphasized that passage of the Alaska Lands Act was among his administration's top priorities; he often referred to the bill as the most important piece of environmental legislation of this century. The eventual signing into law of the act, which is designed to preserve the wilderness of this magnificent state, will surely go down as one of Mr. Carter's finest moments.

In his address to Congress, Jimmy Carter warned against discontinuing his administration's (for the most part\*) pro-environmental stance, against a slackening of laws and regulations to protect our natural resources, as was being blatantly hinted at by the Reagan transition team. Well, it appears that no one was listening, not Congress, not the Reagan people.

To the utter consternation and befuddlement of those in the environmental movement—especially the political end of it—Reagan tapped James G. Watt to be this country's next Secretary of the Interior, whose job it is to protect and wisely utilize the environment and its natural resources. If there were any initial fears that the Reagan years were going to be lean ones for environmentalists and fat ones for big business, here in James Watt is the glaring sign. But there is a more important matter here than simply an unwise choice of a Cabinet member: It is an unforgivable misreading of the desires and opinions of the American public, the same one that Mr. Reagan claims constitutes the mandate that put him in the Oval Office.

Now, it is true, as Mr. Reagan has submitted, that there is an overload of government regulations and overall interference in some parts of the environmental arena. An intelligent reevaluation of the red tape would, for example,

allow energy producers to explore for and develop badly needed new sources, ranging from coal to solar. But the key word is *intelligent*, and this is where the Reagan formula—a.k.a. James Watt—goes sour. In his false assumption that America wants new energy at any price, Mr. Reagan has popped the lid off an ecological Pandora's Box that could be difficult to reseal. With the appointment of Mr. Watt as interior secretary, both Mr. Reagan and the whimpy Congressmen—even the usually strong environmentalists among them—who did not have the guts to challenge the choice, have struck a serious blow to the stalwart efforts of Carter the conservationist and the movement in general.

First, an examination of what Messrs. Reagan and Watt consider the public's power-at-any-price demand: It simply is not so, if a number of reports and public-opinion surveys commissioned by the government itself are to be trusted. The most recent is a document from the President's Council on Environmental Quality, an agency appointed during the Nixon era as a diagnostic tool for environmental policymaking. In a CEQ public-opinion poll, the results of which were delivered to President Carter last fall, there is a very clear "mandate" from the people for the protection of America's pristine areas, natural resources and wildlife—no matter what the cost. And most citizens, according to the report, consider themselves "environmentalists." (Ironically, the new President too refers to himself, and his interior secretary, as environmentalists.) Key findings of the survey include: nearly half of those surveyed feel continued improvement of environmental protection must be made "regardless of the cost"; there was a "strong preference" for environmentally benign energy sources like solar and conservation, with 61 percent stressing solar, while nuclear was the least-preferred source; and the level of concern about the "newly perceived problem of toxic chemical waste surpasses that shown for any other environmental problem during the last decade."

In similar studies, conducted over a three-year period and released in four parts between October 1979 and June 1980, the Department of the Interior it-

self found parallel conclusions. The study, sponsored by Interior's Fish and Wildlife Service and conducted by the Yale School of Forestry and Environmental Studies, under the direction of Dr. Stephen R. Kellert, made some fascinating discoveries. In sum, Dr. Kellert's random-sample survey of 3,107 people concluded that a majority favored preservation of the environment even at the expense of jobs, housing and development projects. For instance, 55 percent opposed the principle of building an industrial plant on a marsh needed by ducks and other animals, even if the plant would mean jobs for local unemployed workers. Likewise, 76 percent agreed that when cutting down trees for lumber and paper, resident wildlife should be protected, even if it means higher prices for the end-products. Though relatively few of those asked were aware of the plights of such species as the Hawaiian wolf spider or the furbish lousewort, the majority strongly favored protecting them and other vanishing species in favor of building development or energy projects. *This is what is meant by a mandate from the people.*

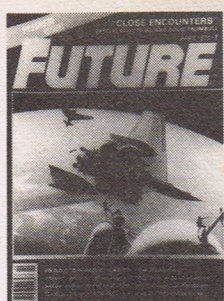
Then there is last year's *Global 2000 Report* to Mr. Carter which, among other scenarios postulated for our upcoming plunge into the next century, painted a gloomy picture for the environment unless immediate steps are taken. Many of these steps are in direct conflict with Mr. Watt's game plan.

Lastly, there is the matter of Mr. Watt himself, who, after inspection, sizes up as a hungry wolf being hand led into the environmental henhouse. Much of Mr. Watt's appetite has been nurtured in the past few years with his active participation as president and chief legal officer for the Mountain States Legal Foundation, a "public interest" gaggle of right-wing lawyers bent on transferring ownership of public lands in the West from the federal government to private energy producers, a move often referred to as the Sagebrush Rebellion. The same man who for the past three years has spearheaded courtroom challenges to the dictums of the Interior Department is now the head of that department. *This is conflict of interest.*

A glance at Mr. Watt's track record  
(continued on page 74)

\*The political footballing that led to Mr. Carter signing a bill giving the go-ahead for the porkbarrel Tellico Dam project in Tennessee remains a disastrous precedent (see FUTURE LIFE #16).





**No. 1—Premiere Issue**  
Interview: Fred Pohl  
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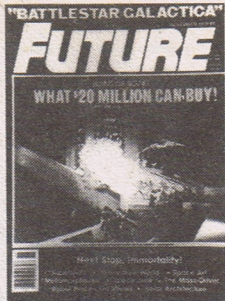
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Tomorrow: Ben Bova



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Interview: Ray Bradbury  
Earthport: Space Station  
Collier's 1951 Space Program



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Architecture: Solar Houses  
O'Neill's Mass-Driver  
Tomorrow: Robert Anton Wilson



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Future Planetary Probes  
San Diego Space Theater  
Careers in the Space Program



**No. 8—**  
Arcosanti: Future City  
Space Art: David Hardy  
Earthsat: Computer Photos



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The Real Albert Einstein  
Planetaryium, Space Art  
Tomorrow: Jacques Cousteau



**No. 10—**  
Interview: Timothy Leary  
O'Neill: Space Colony Plans  
Tomorrow: Roger Zelazny



**No. 11—**  
Aliens: Hollywood & NASA's  
Holography & Videodisks  
Tomorrow: Larry Niven



**No. 12—**  
Apollo II Revisited  
Cryonics and Immortality  
Interview: Robert Silverberg



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Genetic Engineering  
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Interview: John Varley



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Interview: Frank Herbert  
Russian Space Art  
Tomorrow: A.E. Van Vogt



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Frank Herbert on "Dune"  
Russian Space Art  
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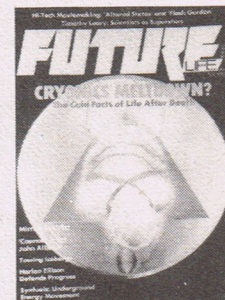
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Robert Anton Wilson on  
human intelligence  
Homegrown robots



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Preview of *Cosmos*  
Futuristic sailing ships  
The pro-space movement



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Rundgren's Video Utopia  
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Interview: Norman Spinrad



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Flash & Altered States  
Energy Alternatives  
Tomorrow: Timothy Leary





PHOTO: COURTESY G. HARRY STINE

**G.** Harry Stine began his career in rocketry and writing at the same time: 1951. With Robert A. Heinlein as his mentor, Stine published his first science-fiction story in 1951 and went to work as an engineer at White Sands Missile Range, New Mexico, in the same year. He is also the founder of the international hobby/sport of model rocketry. He was one of the first people to recognize the many benefits of space utilization and was a prime consultant on the definitive NASA study conducted by Science Applications, Inc. in 1977-1978, on financial and management scenarios for Solar Power Satellite systems (1979) and on the military implications of an SPS system (1980). He has testified before Congress three times concerning the direction of future space programs. He is a director of the Space Coalition.

Stine is the author of more than 27 books, numerous scientific and technical papers, and hundreds of magazine articles. His most recent books include *The Third Industrial Revolution* (Ace Books, 1979), *The Space Enterprise* (Ace Books, 1980), *Space Power* (Ace Books, Sept. 1981), and *Space War of the Future* (Prentice-Hall, Fall 1981). He writes science fiction under the pseudonym "Lee Correy," and his new SF novels include *Star Driver* (Ballantine Del Rey, 1980), *Shuttle Down* (Ballantine Del Rey, 1981), *Space Doctor* (Ballantine Del Rey, 1981) and two *Star Trek* novels for Pocket Books, *The Abode of Life* and *The Waif of the Enterprise*. He writes a regular column on space industry for *Omn*i magazine as well as "The Alternate View" column in *Analog* magazine. He does all his writing on a microcomputer word processor.

## Cheops Meets the Space Shuttle

**R**obert A. Heinlein's *The Notebooks of Lazarus Long* contains the definitive statement of Cheop's Law: "Nothing ever gets built on schedule or within budget."

A lot of people seem to think the NASA Space Shuttle is a prime example of the reality of Cheop's Law.

It is. But why? And why is "Cheop's Law" one of the unwritten truisms of engineering and technology?

Engineers live with it every day because they, not the scientists, are the people who must transform ideas and concepts into workable hardware. It's important for non-technical space advocates to understand the reasons, because the NASA space shuttle isn't the first or the last project that will cost more to accomplish and take longer than planned to complete. And because the NASA space shuttle was *not* designed and built by scientists, but by engineers and technicians who, since the days of Cheops or before, have struggled against the perversities of nature exemplified by Cheop's Law and the broader Murphy's Law and all its corollaries.

Engineers are not scientists. The difference is best summarized by the different philosophies of the two.

A scientist operates basically follow-

ing the dictum of Lord Kelvin (William Thomson) stated in 1886:

*"I often say that when you can measure something and express it in numbers, you know something about it. But when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, progressed to the level of science, regardless of what the matter may be."*

An engineer, on the other hand, operates in a different manner. Much of engineering is empirical art, not precise scientific knowledge. Engineers acknowledge this when they use the term "state of the art." Whereas scientists often make progress in a series of discontinuous leaps of creativity and understanding known as "quantum jumps," engineers are basically highly conservative and highly reluctant to abandon methods that are tried and proven; at best, they'll incorporate *one* new concept, idea or device at a time into a new design. If that works, they'll use another new idea on the next job. If a fuse blows, they'll shrug and put another fuse in; if the fuse blows again, they'll go looking for the reason why. But engineers will

rarely undertake a job with a high probability of blowing *all* the fuses.

A scientist can afford to have an experiment fail; it's often just as important to have an experiment fail as to have it succeed because a scientist will learn something regardless of the experimental outcome.

But an engineer *can't* afford to have the bridge collapse or the wing fall off the airplane. The engineer is faced with the awesome task of designing buildings, bridges, vehicles and other devices upon whose integrity human lives depend. Failure is the hallmark of bad engineering. If there seems to be a large number of technical failures occurring, it's not only because of better communications but perhaps because there are a larger number of engineers around... and since the percentage of bad engineers remains constant, there are therefore a larger number of bad engineers. (Facetious engineering definition of a Chief Engineer: A person devoid of all engineering knowledge who marries the boss's daughter.)

To a scientist, the critical item is the repeatable experiment and the product of his work is the written scientific paper.

To an engineer, the product is the safe, reliable, repeatable system. The paperwork—the proposal, the contract, the budget, the drawings, the specifications and the change orders—are only the things that help make it all happen.

In addition, an engineer has *got* to make it work. That's what the engineer gets paid for. The technician and the mechanic do what the engineer tells them, which adds another burden on the engineer who must now also handle people in addition to coping with an arcane and empirical art. Once the engineer completes and approves of the design and the drawings and the specs and all the other cerebral outputs, the system must be *made* to work. This is the most frustrating task of an engineer and also the most satisfying when it's all over, because most of the time and money lavished on *any* engineering project is involved with diddling, fiddling, tweaking, fine-tuning, adjusting, changing, modifying and otherwise working with a plethora of nagging little details in order to get the system to work the way it's supposed to.

The more advanced the technology, the more difficult this final stage of

PHOTO: NASA







engineering becomes, because the engineers are dealing with things they detest and enjoy simultaneously in a technical love-hate relationship: unknown elements at the very limits of the state of the art.

And that's precisely what's happened to the NASA space shuttle and why it's been just as susceptible to Cheop's Law as any other technical program in history.

The details of why this is so are interesting. The space shuttle was designed in the mid-1960s as one element in a proposed NASA manned Mars landing mission which was to follow the Apollo manned lunar landing missions. This was in the halcyon days when Congress would appropriate almost unlimited funds for space because of the political acumen of one Lyndon Baines Johnson, sometime leader of the U.S. Senate, Vice President and President, as well as chairman of the Space Council that resulted from the Soviet Sputnik humiliation. (Nikita Sergeivich Khrushchev and Lyndon Baines Johnson are the two men responsible for that "small step for man" when you analyze the situation historically.) Piece by piece, the manned Mars landing mission fell apart under the whirling budgetary knives of a Congress bent on social programs instead of space spectacles. The manned Mars mission itself went down the tubes first. This was followed by the space station segment of the original plan. What was saved was the space shuttle, the reusable manned space truck whose original job was to orbit the loads required to



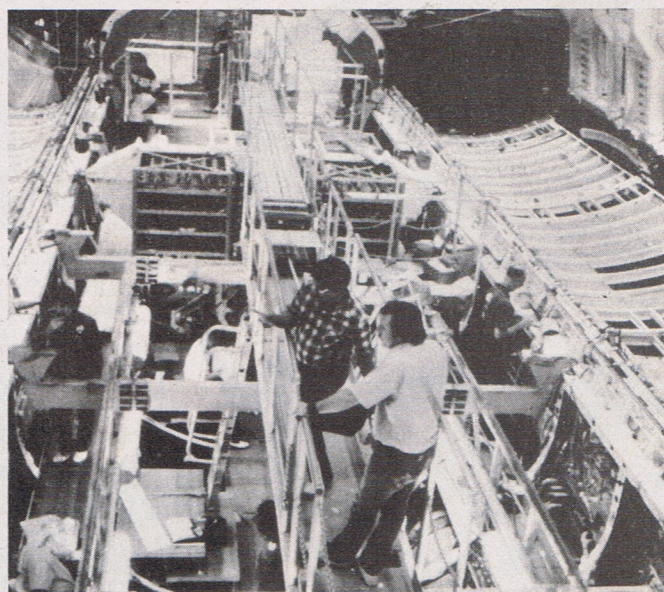
Shuttle pioneers: Crew commander John W. Young (left) and pilot Robert L. Crippen.

build the space station and the manned Mars space vehicles. As a result of the original system analysis of the manned Mars landing mission, the space shuttle's most economic and technically feasible payload was determined to be 65,000 pounds, 60 feet long and 15 feet in diameter. Thus was the basic criteria for the current space shuttle established in the late 1960s.

The space shuttle system itself suffered the privations of budget cutting by losing its manned, reusable, fly-back lower stage. Then it lost its own internal

propellant tanks in favor of the expendable external tank. The current design of the space shuttle was determined in 1970-1972 *not* by engineering capabilities and efficiencies, but by political budgetary constraints. The current space shuttle design was the cheapest way out (it was thought) at the time and the only way it could be achieved at all, Congressional funding politics being what they were.

The space shuttle design was therefore frozen with the engineering state-of-the-art of 1970-1972. In most cases, the en-



PHOTOS: NASA

Engineers and technicians at work. Left: Heat-resistant tiles are glued to *Columbia's* hull. Right: Workers fill the shuttle's guts.



engineers and managers who made the engineering decisions leading to the present space shuttle have either retired or gone on to other jobs, leaving another generation of engineers the unenviable task of making it all work.

It hasn't been easy.

The performance requirements of the space shuttle system required the largest solid-propellant rocket motors ever built.

These same performance requirements demanded a rocket engine using liquid oxygen and liquid hydrogen that not only operated at extremely high efficiency—meaning that it had to operate at a very high temperature and a very high combustion pressure—but that could be operated over and over and over again in contrast to previous missile rocket engines that had to operate only once for a few minutes at the most.


The reusable orbiter required a whole new system of thermal insulation: the tile system. Today, engineers would do it differently and they're looking into possibilities for future unbuilt orbiters. But in the meantime, they're stuck with making 1970 technology work.

The NASA space shuttle system, in spite of being designed with 1970s technology, represents the largest, fastest, most powerful manned winged vehicle ever to fly.

The delays were inevitable. Any engineer worth the title could have and did forecast the delays because the schedules were put together and presided over with *political* considerations as Number One Priority. And because the engineers and technicians and mechanics were working with technology that was out at the frontiers of the state of the art.

And that's the simplest answer to why the space shuttle is late, expensive and far from what *could* have been.

The public dismay and criticism has been caused by the perception that *scientists* were building the space shuttle, and scientists—partly because of secrecy imposed on some parts of science since the days of the atom bomb and partly because scientists tend to speak only to one another in jargon—are perceived as wizards who can make anything happen.

The bald truth is that the space shuttle is just another highly advanced *engineering* project being accomplished in the same manner as any other engineering project by people who realize they're practicing an art form. 

## The Shuttle vs. Murphy's Law

**D**uring its brief history, the shuttle program has been plagued by a series of snafus which seem to play right into the hands of Murphy's Law: *If something can possibly go wrong, it will. What follows is a list of some of the finer examples of this universal dictum.*

**January 5, 1972:** President Richard Nixon announces the official decision to develop the space shuttle program. The first flight is scheduled for *late 1978*, and the cost was estimated at *\$5.15 billion* (in 1971 dollars).

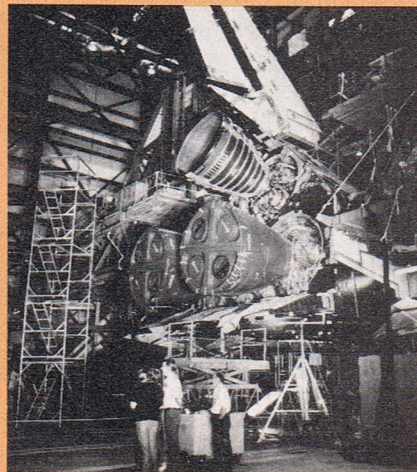
**February 18–November 18, 1977:** The first shuttle, the *Enterprise*, successfully undergoes a series of 17 approach-and-landing tests. The shuttle rode piggy-back aboard a specially adapted Boeing 747. Though the landing went smoothly enough, it was determined through engine-component tests that the first-flight date would have to be pushed back to at least *mid-1979*.



**February 1979:** The Ad Hoc Committee for Review of the Space Shuttle Main Engine Development Program, in its second report, reveals that there are still further problems and that the launch date should be postponed to *April or May of 1980*.

**November 1979:** Problems develop with the shuttle's 30,761 protective tiles, affixed to the hull of the orbiter to resist the 3000+ degrees F to be encountered during reentry to Earth's atmosphere. They keep falling off. Within the next year a new silica-based coating is developed which increases the tiles' adhesive properties.

**February 1981:** Proposed date for the final flight-readiness firing of the shuttle's engines. If this and other tests check out, the craft will be ready for lift-off.



**March 17, 1981:** Presupposing that all systems are "Go," the Space Shuttle Orbiter 102 *Columbia* will blast off from Kennedy Space Center in Florida. The mission will bring the shuttle on a 54-hour journey around the planet; that's approximately 36 orbits, if you figure about 90 minutes per orbit. The shuttle will be piloted by astronauts John Young and Robert Crippen. Approximate costs: *\$8.8 billion*.



# Earth Control

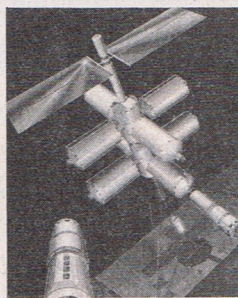
(continued from page 68)

bears (sorry, Smokey) this out. The Mountain States Legal Foundation was founded and is largely funded by Joseph Coors (of Coors beer renown), a leading figure of conservative causes and long-time political and financial backer of Ronald Reagan. Interestingly, Mr. Coors is also the proud owner of 106 oil and gas leases on 97,005 acres of public land in Colorado, and two coal mines, one of which is waiting for a strip-mining permit from—you guessed it—the Interior Department. The beer baron's touch also reaches into the controversial topic of oil shale exploration, much of it involving exploitation of public lands. Mr. Coors is hoping that the patent his company holds on a component for oil shale conversion will be instrumental in the development of synthetic fuels (see *FUTURE LIFE* #24), since that development depends largely on a decision from . . . James Watt's Interior Department.

The foundation's board of directors and major money sources reads like a Who's Who of the energy industry: Exxon, Peabody Coal, Gulf Oil, Summa Corp., Amax and others. Many of these firms have been participants in several of the lawsuits fought by the Mountain States Legal Foundation. And, according to a report in the *Village Voice* (Jan. 28, 1981) written by Alexander Cockburn and James Ridgeway, the foundation has some eyebrow-raising ties with the gambling industry, and many of the biggest interests in Las Vegas and the state of Nevada. *This* is conflict of interest.

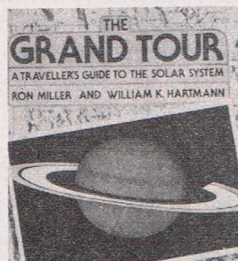
April marks the 11th year since Earth Day, when this country decided to do something about the rapid deterioration of the environment. Laws were passed, programs were implemented, action was taken. But more importantly, people's attitudes (well, *most* people's attitudes) have since then changed toward this abuse of Earth: Stop it, they are saying. It seems an unwise choice to allow someone with such a clear record, as James Watt has, for disregard for these principles to become the administrator of them. As the interior secretary looks for ways to apply his concept of multiple use of our natural resources, he—and his boss—would do well to keep a keen eye over his shoulder for that environmental mandate. □

## next issue



### SPACE OPERATIONS CENTER

With the shuttle finally on its way, a new era in space exploration has begun. Now what? NASA planners have worked out a definite goal that could pave the way for our future in space—the Space Operations Center. A permanent manned space station, SOC is a radical departure from previous space station designs. Next issue we'll take you on a tour of the proposed project, complete with its history of development, its technological background and how it may become a reality.



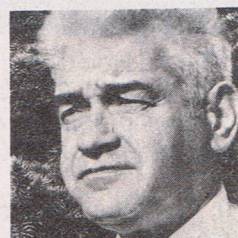
### RON MILLER

*FUTURE LIFE*'s space art advisor has recently completed close to 100 new astronomical paintings that are, literally, out of this world. They're all part of a new book that Ron and William K. Hartmann have just completed. It's called *A Grand Tour: A Traveler's Guide to the Universe* (Workman Publishing) and you'll see an exclusive peek into this spacey volume in a colorful portfolio of the artist.



### SURVIVALISTS

While the rest of us watch world affairs with some nervousness, there is now a disparate group of people who are preparing themselves for the worst. Whether it be nuclear holocaust, urban rioting or general economic collapse—the Survivalists are sure that the sky is falling, and they are building bomb shelters, hoarding food and arming themselves in preparation. Join us for a close-up look at these modern-day chicken littles.



### INTERVIEW: PETR BECKMANN

Dr. Petr Beckmann is a professor of electrical engineering at the University of Colorado. He is also the author of more than a dozen books, including the best-selling, controversial and informative *The Health Hazards of Not Going Nuclear*. Beckmann answers questions on nuclear energy, its alternatives and the world's energy future.

### PLUS

Ed Naha tells how the new science fiction film *Outland* brings murder to an outer space mining colony . . . A look at how the Soviets are adapting their space stations for their cosmonauts and their cosmonauts for space . . . Kent Bash's existential art . . . A possible model for our first space station . . . Plus Harlan Ellison, Alternate Space, Earth Control and Soundscape views, Databank news, book reviews and a colorful look at the latest in video technology.

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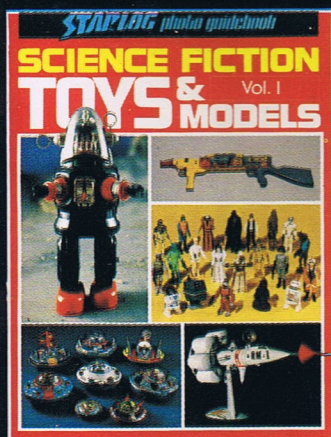
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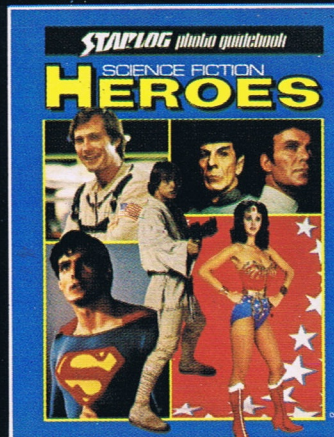
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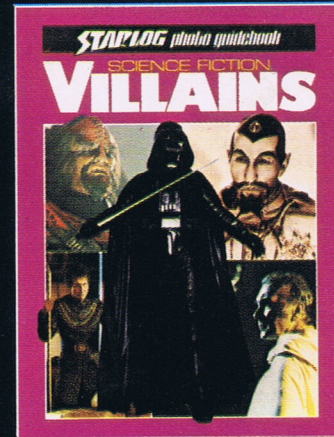
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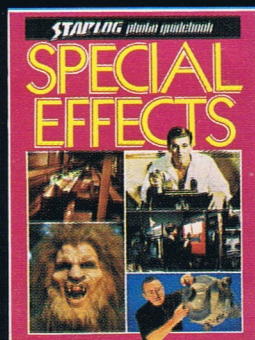


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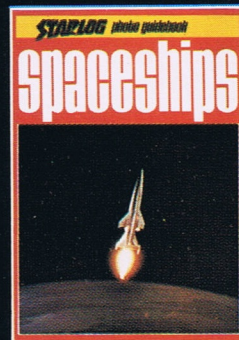
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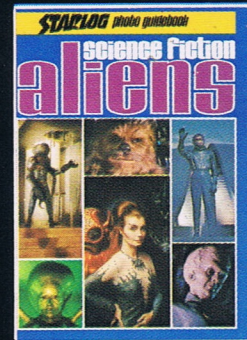
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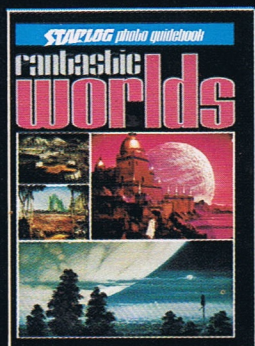
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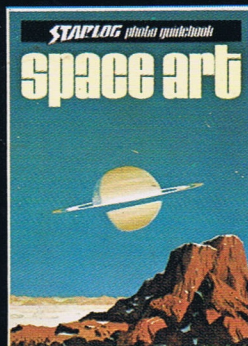
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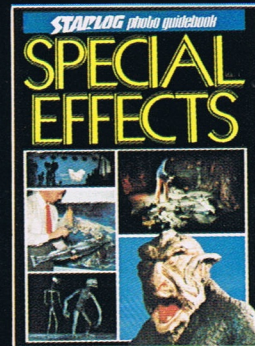
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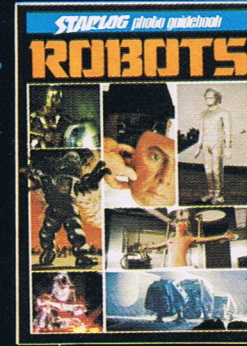
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# EXCALIBUR

John Boorman's "EXCALIBUR"

Nigel Terry • Helen Mirren • Nicholas Clay

Cherie Lunghi • Paul Geoffrey and Nicol Williamson


Executive Producers Edgar F. Gross and Robert Eisenstein

Directed and Produced by John Boorman

Screenplay by Rospo Pallenberg and John Boorman

Adapted from Malory's Le Morte d'Arthur by Rospo Pallenberg

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